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Final Supplemental Environmental Impact Statement

Young Dodge

Rexford Ranger District, Kootenai National Forest
Lincoln County, Montana

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Environmental Impact Statement
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Abstract: The Young Dodge Draft Environment Impact Statement (DEIS), released February 2008, documented the detailed analysis of three alternatives, including the no action alternative, developed for the Young Dodge project. Alternative 1 is the Proposed Action and includes timber harvest, fuel treatments, road management, and recreation management activities. Alternative 2 is the No Action Alternative and proposes no further major activities. Alternative 3 is another action alternative, but closely follows requirements of the Forest Plan without the need to amend the Plan. The Young Dodge Record of Decision (ROD) selected Alternative 1 and was released at the same time as the Final EIS. The legal notice of decision was published in the newspaper of record on May 1, 2008. The ROD was appealed. Following administrative review the decision was reversed based on inadequate analysis of the effects on goshawks.

The Draft Supplemental EIS (DSEIS) was released in June of 2010 and provided additional documentation of the first three alternatives that were analyzed in the Young Dodge DEIS and to add Alternative 1-Modified based on further public comment. This alternative modified some prescriptions and included information that was gathered since the release of the ROD. The majority of changes were clarifying the intent of the treatments, analysis, and conclusions, or updating analysis that has been affected by the passage of time or new information. Alternative 1M has been identified as the Preferred Alternative. In response to public comment, further analysis of a boat ramp at three separate locations is included in Appendix 10.

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CHAPTER I – PURPOSE AND NEED FOR ACTION

INTRODUCTION

The Young Dodge Final Supplemental Environmental Impact Statement (FSEIS) is a site-specific environmental effects analysis of management activities proposed in the Young Dodge Project Area (Project Area), which is comprised of the Young and Dodge Creek drainages. The legal description is all or parts of T37N R28W and part of T37N R29W, PMM, Lincoln County, Montana. The Project Area is located approximately 7 miles northwest of Eureka, Montana, on the west side of Koocanusa Reservoir. Please refer to the vicinity map in MAP 1-1.

The Project Area encompasses approximately 37,900 acres on the Kootenai National Forest (KNF). There are approximately 32,599 acres (86%) of National Forest System (NFS) land; 3700 acres (10%) of private land, and 1570 (4%) of State land in the Project Area.

BACKGROUND

The Young Dodge Interdisciplinary Team (ID Team) conducted an assessment of the Project Area in the summer/fall of 2006 and spring of 2007. Following the appeal of this project, additional assessment work was conducted for some resources during the fall of 2009. These assessments utilized an ecosystem approach where physical, biological, and social factors were considered, both on a landscape and stand-level basis. Those resources were: Human Uses (cultural resources, transportation system, recreation, public access, scenic resources, range, minerals, and economics); Aquatic Resources (hydrology and fisheries); and Terrestrial Resources (geology and soils, vegetation, fuels management, air quality, and wildlife).

The factors were addressed in terms of the existing condition, reference condition, and desired future condition. The **existing condition** describes the current condition of the resources in the Project Area, and was drawn from database information and field reviews. The **reference condition** is the range of conditions that would be expected to occur in a particular forest type when ecological processes are functioning properly. They are expressed as a range because of the dynamic nature of ecological systems. Reference conditions are assumed to be ecologically sustainable. Reference conditions for social factors were addressed in terms of identified public needs/desires and opportunities within the Project Area. This refers to such activities as recreation facilities, road and trail access, and special uses.

The **desired future condition** considered ecological processes, as well as social needs and desires. Included in this determination was the identification of opportunities for moving resources toward their desired future conditions, as identified in the *Kootenai National Forest Plan* (1987a) and other documents, including the *Lincoln County Montana – Community Wildfire Protection Plan* (2005); *Kootenai National Forest Vegetation Response Units Characterizations and Target Landscape Prescriptions* (Gautreaux 1999); *Four Threats to the Health of the Nation's Forests and Grassland* (2003); *The Northern Region Overview* (USDA Forest Service 1998); and the *National Fire Plan* (2001). These opportunities formed the basis for the Proposed Action and its alternatives, which were analyzed in this FSEIS.

PURPOSE AND NEED FOR ACTION

Some resources in the Project Area are exhibiting conditions and trends that deviate from the reference conditions identified during the ecosystem assessment. In some cases, these are affecting forest health (diversity and productivity), and are having social and economic consequences. In addition, some conditions are not trending toward or providing for the Desired Future Conditions. These conditions and consequences are summarized below and will be addressed in detail in Chapter III.

Generally, within the vegetation resource, the dry forest types (32% of the NFS lands in the Project Area) have experienced a species shift from ponderosa pine to Douglas-fir, and increasing tree densities due to fire suppression, resulting in an increased risk of insect and disease attack. Open forests dominated by ponderosa pine and western larch are more sustainable than dense stands with a heavier component of Douglas-fir (Heyerdahl et al 2008; Blume 2003; Arno et al 1997; Arno et al 1995). These lands are mostly in the wildland urban interface. There is an increasing risk that wildfires could burn more intensely and spread more rapidly, escaping initial attack. Wildfires that historically would have been low-intensity ground fires now have a higher risk of developing into stand-replacing crown fires that could threaten resource values on NFS lands and compromise the safety of forest users. Some of these stands were treated in the past and need a maintenance treatment or there is a need to treat other stands to create more complete fuel breaks. The West Kootenai community is adjacent to these dry forest types.

At the higher elevations, moist and cold forest types have high to extreme fuel loads due to lodgepole pine mortality that occurred in the late 1980s and early 1990s. These conditions elevate the inherent high risk of stand-replacement fires in these forest types. These areas provide important habitat for species such as lynx and goshawks. Landscape-scale disturbances in these habitats could have considerable effects on these species. Large catastrophic wildfires can create an unfavorable juxtaposition and quantity of denning and winter foraging habitat for lynx and nesting/foraging habitat for goshawks, possibly resulting in the temporary displacement of these, as well as other species. In the most extreme situations, wildfires can sterilize the soil resulting in long-term recovery of these fire-altered habitats.

Large, normally fire-resistant trees would succumb to these stand replacement fires. Heavy mortality of large, normally fire-resistant trees was observed on the North Fork, Webb, Stone Hill, Lydia, and Young J fires, large stand-replacing fires that occurred on the Rexford Ranger District in 1994 and 2000 (USDA Forest Service 2009). These large trees add to the stand structure diversity and composition of the landscape and are the vital component of old-growth, an important component of the habitat for many wildlife species.

White pine blister rust, an introduced disease, has significantly decreased the western white pine component in the moist forest type, and whitebark pine in the cold forest type. Western white pine is important because it is a long-lived seral species and is typically a component in moist forest old growth. Whitebark pine is an important species because its seeds serve as a food source for grizzly bears and Clark’s nutcrackers.

Fire suppression has reduced the number of mixed severity fires and has resulted in increased stand density, especially in the mid-elevation range. In the absence of mixed-severity fire or stand thinning, larch is losing dominance and is being replaced by more shade tolerant species (USFS 1998). This is another historic aspect of stand structure that will be addressed in this project. Larch is another large, long-lived species that adds much to stand structure and old-growth characteristics (USDA 1998). The Vegetation and Disturbance Processes section of Chapter III contains a description of the forest types.

Stand-replacing wildfires can result in undesirable ecological and social impacts such as increased erosion, losses in soil productivity, increased run-off and sediment delivery to streams, loss of timber resources, impacts to scenic quality, loss of wildlife habitat, and reduced recreational opportunities. These conditions would not meet the desired future conditions described in the *Kootenai National Forest Land and Resource Management Plan* (Forest Plan II-17-19).

Desired Future Condition

Overall, the ecological desired future condition throughout the Project Area is a landscape that is resilient to disturbances such as insects, disease and fire. Stand structure, tree species composition, and patch size and arrangement would be similar to historic conditions under a natural fire regime. The landscape would contain a mosaic of young stands as well as some old growth habitats and a mixture of intermediate and mature forest types. The landscape would provide a variety of habitat conditions to support all indigenous flora and fauna. The presence of endemic insect and disease levels would be part of the environment. The desired arrangement of stands and stand conditions in the lower elevations would modify wildfire behavior by minimizing the potential for crown fire and keeping fire on the ground, thereby allowing for direct-attack fire suppression on a typical burn day, especially in the wildland urban interface. Some stands in the urban interface need to be treated because they are not meeting the desired conditions of minimal ladder fuels and light ground fuel loadings. Some previously treated stands are in need of maintenance treatments, such as underburning, to maintain fuel treatment effectiveness while protecting the large-tree component for nesting raptors (eagles, osprey), and providing an array of habitats for other animals at lower elevations.

At middle and higher elevation stands, treatments would focus on creating larger, secure blocks of habitat. These larger blocks can be managed over longer time frames with little or no disturbance between major entries, thus providing more habitat security for a variety of species. This “pulsed” disturbance regime is more natural and provides more benefits to soils, watersheds, and wildlife over time.

The desired future condition from a social stand point is to provide an array of recreational opportunities to forest users. This would include both motorized and non-motorized access opportunities and the development of new recreation sites. There is a need to provide a system of access roads and trails that would meet resource management and user needs while minimizing resource impacts. The system would clearly identify the areas where motorized vehicle use is permitted, including the types of vehicles and the season of use. Road design and maintenance would meet current BMP standards for water and air quality. Road management would provide for wildlife habitat and security needs. The road system would provide for a variety of safe travel opportunities for forest visitors. Some forest users have identified the need for other types of recreation. Improvements to a trail and lookout, and development of a boat launch are the desired conditions for a growing segment of the public.

The ID Team identified specific actions that could be taken in those situations where existing conditions either are not meeting desired future conditions or are not moving toward desired future conditions. Collectively these items form the Purpose and Need for Action, which would help move the area toward the conditions described in the *Northern Region Overview* and the *Analysis of Management Situation for the Revision of the Kootenai and Idaho Panhandle Forest Plans* (2003), and would help achieve Forest Plan goals, objectives, and standards. The following summarizes the ecological and social factors that have contributed to the changed conditions and form the basis for the Purpose and Need for Action.

Ecological Factors

In assessing the ecological environment, many of the differences between reference and desired conditions can be traced to the impact that past fire suppression has had on the landscape. Many mid and upper elevation areas have vegetative conditions that are conducive for a stand-replacing fire (USDA 2003a). Frequent, low-intensity fires historically burned through low and some mid-elevation stands, which maintained more open stand conditions than are observed today (Heyerdahl et al 2006; Blume 2003; Arno et al 1997; Arno et al 1995). Fire suppression changed the fire cycle in these stands, producing the following changes:

- A build-up of ground and ladder fuels (fuel accumulation)
- Change in species composition
- Change in forest structure (vertical arrangement)
- Increase in insect and disease levels

Past regeneration harvest, which was generally limited to units less than 40 acres, resulted in the following change:

- Change in patch shape, size and distribution.

The following discussion identifies *why* and *how* these changes have affected the vegetative conditions within the Project Area and their relationship to the Purpose and Need for Action. It also describes the type of activity proposed in the Young Dodge project that responds to each Purpose and Need. Changed vegetative conditions have a cascading effect on other resources that are described in more detail in Chapter III.

The Purpose and Need for Action is to:

A. Reduce fuel accumulations, both inside and outside of the Wildland Urban Interface, to decrease the likelihood that fires would become stand-replacing wildfires

This Purpose and Need for Action statement addresses the first of the identified changes caused by fire suppression (a build-up of ground and ladder fuels). "Wildland fires are a part of the natural ecological cycle of forest ecosystems" (Lincoln County Montana 2005 p 1). Historically, low-intensity wildfires occurred frequently (every 10-40 years) in low elevation, dry, fire-dependent ecosystems such as those in a portion of the Project Area. Most small-diameter understory trees were killed but the larger diameter, fire-resistant trees survived, which maintained a relatively open forest condition composed primarily of widely-spaced ponderosa pine, larch, and Douglas-fir trees. Frequent, low intensity fires in the drier portions of the Project Area kept fuel accumulations low (Heyerdahl et al 2008; Fisher and Bradley 1987).

However, as a result of over 90 years of fire suppression and past timber harvest, some areas of open forest have been replaced by dense thickets of small-diameter Douglas-fir and higher tree densities than would be expected under natural conditions, along with dead and down fuels. This has resulted in an increase in aerial/ladder and surface fuel loadings. The buildup of fuel increases the risk that a fire will escape suppression actions and escalate into a stand-replacing fire. Forty-eight percent of the Project Area falls within the Wildland Urban Interface (WUI)[1], which incorporates private landholdings, homes, and the West Kootenai community. Stand-replacing fires threaten lives and property. Therefore, fuels within the WUI need to be treated to reduce the risk that stand replacing fires present. The Young Dodge project responds to this purpose and need statement by proposing timber harvest and prescribed burn treatments.

Timber harvest and prescribed burning in some stands in the WUI during the past two decades have effectively reduced fuel loadings. Some of these units need to be treated again in order to maintain conditions consistent with reference conditions. Existing and reference fuel loadings are displayed in the Fuels Section of Chapter III. Prescribed burning without harvest will be used to emulate the "natural ecological role" of fire by reducing the surface fuels that have built up over the years, stimulating the

[1] "The Wildland Urban Interface is commonly described as the zone where structures and other human development meet and intermingle with undeveloped wildland and vegetative fuels. The WUI zone poses tremendous risks to life, property, and infrastructure in associated communities and is one of the most dangerous and complicated situations firefighters face" (*Lincoln County, Montana – Community Wildfire Protection Plan, p.6*).

growth of forage, and helping restore the overall health of the forest. Please refer to Appendix 4 for information on the potential effectiveness of fuel treatments in the WUI.

In portions of the Project Area outside and upwind of the WUI, the buildup of fuel has occurred due to a combination of natural mortality (competition), disturbance-induced mortality (wildfires, windthrow, insects, and disease), and fire suppression. This has resulted in undesirable fuel arrangements and continuity. The moderate-to-high fuel levels in these stands increase the risk that fire starts may escape suppression and become stand-replacing wildfires. These elevated fuel levels pose a risk to those fighting fires, forest users, local homeowners, and to forest resources.

How the Young Dodge Project Responds to Purpose and Need Statement A

The desired condition is characterized by stands that contain lower fuel loadings than what currently exist and are closer to those that historically occurred. The risk of fire starts becoming stand-replacing events will be reduced in treated areas. The continuity of fuels across the landscape will be broken, thereby reducing the potential for fires to spread. Firefighter safety will be improved where intensities and rates of spread allow for direct-attack fire suppression. Treated areas may provide safety zones for people and equipment. The activities contained in the Alternatives have been prioritized to address the areas that pose the highest risk or are areas that have been treated with prescribed fire in the past and are due to be treated again. These activities are located in areas that augment past harvest units that have become less effective fuel breaks due to needle accumulation and vegetation re-growth. Activities that would help move existing conditions toward desired conditions include all harvest activities with associated fuel treatments, fuel treatments with mechanical pre-treatment, and underburning without harvest.

B. Restore historical vegetation species and stand structure

This Purpose and Need for Action statement addresses changes caused by fire suppression, white pine blister rust, and the mountain pine beetle outbreak in the 1980s and 1990s These changes include a change in species composition, a change in forest structure, and an increase in insect and disease levels. Some forested stands in the Project Area are exhibiting conditions and trends that deviate from the reference conditions described in *Kootenai National Forest Vegetation Response Units Characterizations and Target Landscape Prescriptions.* At low elevations, ponderosa pine was the dominant species. Fire suppression coupled with early timber harvest practices, caused a dramatic shift toward Douglas-fir, a species that is shorter-lived and highly susceptible to root disease and insect attacks.

In the mid-elevations, fire suppression, white pine blister rust and the 1980s/1990s mountain pine beetle outbreak all played a role in replacing western white pine, ponderosa pine, and western larch with subalpine fir, western red cedar, and western hemlock. These species are more susceptible to fire, drought, and disease.

Historically, whitebark pine was the principal long-lived species in high-elevation (over 6000 feet) stands. Today, Engelmann spruce and subalpine fir have gained a competitive advantage, resulting in a diminished and decadent whitebark pine component in these habitats.

Fire suppression has affected stand structure across all elevations. This has resulted in a high density of smaller diameter (<8") trees in many stands. Stand structures in the lower elevations have shifted from somewhat open stands dominated by large, shade-intolerant trees to dense stands dominated by thickets of shade-tolerant trees. Denser stand structures across all elevations have increased competition between trees, making the large-tree component less vigorous and more susceptible to drought, insects, and disease. These dense structures also make a stand-replacement fire, which destroys the large-tree component, more likely (Graham et al 1999 p 1; Pollet and Omi 2002 p 1).

Fire suppression has affected stands by creating conditions that increase the susceptibility of trees to insect and disease. An increase in stand density in all forest types and a shift in species composition toward Douglas-fir in the dry and moist forest types has increased the susceptibility to bark beetle attack. Additionally, Douglas-fir is very susceptible to root pathogen mortality. Dominance by Douglas-fir can convert root pathogens from thinning agents to landscape-scale disturbance agents.

White pine blister rust, a non-native disease, has significantly reduced the western white pine component in the moist forest type. This is important because western white pine is a long-lived seral species that is highly resistant to most native diseases and is an important component in moist forest old-growth.

The mountain pine beetle outbreak in the late 1980s and early 1990s affected species composition and stand structure. These effects are predominantly in the mid- and upper-elevations. Effects at low elevations have been less pronounced. Heavy mortality of lodgepole pine by the mountain pine beetle during this outbreak left many mid- and upper-elevation stands understocked with extreme fuel loads. The trajectory for these stands is to sustain a stand-replacing crown fire in the next 10-80 years under one of the following scenarios: (1) within the next 10-20 years, the stands sustain a high-intensity crown fire, replacing the stands; or (2) the stands escape stand-replacing wildfire during the next 20 years, allowing a component of shade tolerant, fire-susceptible species to establish. Within 20-80 years, the stands are likely to sustain a stand-replacing crown fire of extreme intensity due to the combination of high ground and ladder fuels (Fisher and Bradley 1987 pp 25-65).

How the Young Dodge Project Responds to Purpose and Need Statement B

The desired condition is characterized by low- to mid-elevation stands that are fire-tolerant and drought-, insect-, and disease-resistant. These are also typified by more open stand structures that more closely resemble what likely occurred under natural fire cycles (Heyerdahl 2008; Blume 2003; Arno et al 1997; Arno et al 1995). Timber harvest and prescribed burning in the low- to mid-elevations would act as low-severity and mixed-severity fire surrogates, and move these stands toward the desired condition.

At upper-elevations, stands meeting the desired condition would contain a greater component of whitebark pine. The proposed prescribed burning in this high-elevation habitat would help develop conditions favorable for the establishment and survival of whitebark pine, which has been identified as a Species at Risk in the *Northern Region Overview*. Activities that would help move existing conditions toward desired conditions include the mid- and higher-elevation regeneration harvests, and commercial thinning; and prescribed ecosystem and maintenance burns at lower elevations.

C. Restore historical patch sizes

This Purpose and Need for Action statement addresses the last of the identified changes caused by limits on past regeneration harvest size, which was generally limited to units to less than 40 acres. These limits caused a change in landscape patch size, shape and distribution.

Patches are areas of vegetation similar in structure, composition, and origin that resulted from natural disturbances such as wildfire, windthrow, or insect and disease infestations. In the Project Area, patch sizes historically ranged from 20 to 5000 acres, depending upon the Vegetation Response Unit in which they were located (Gautreaux 1999). Triepke found that the historical (pre-1930) average patch size in the Upper Kootenai sub basin was 400 acres in the drier forest type, 600 acres in the moist forest type and 1000 acres in the cold forest type. Most patches in all types were over 300 acres (USDA Forest Service 2003). Large patches that develop into interior forest are important from a wildlife standpoint. A variety of species, including woodpeckers, goshawk, lynx, fisher, and elk require relatively large areas of interior forest habitat for security and other reasons. Hillis et al (1991) determined that the minimum patch size needed to provide effective security for elk is 250 acres.

Smaller patch size does not influence wildfire behavior in the same manner that larger patch sizes do. By limiting treatments to openings less than 40 acres, the arrangement and amount of fuels within the untreated acres of forest create conditions that are more susceptible to uncontrollable wildfire. Small harvest units allow wildfires to spread fairly easily through surrounding continuous forests stands. A unit matching reference condition patch size with the fuels treated following harvest would have a greater chance of slowing the overall rate of fire spread and intensity.

Existing patches differ, in both their size and shape, from those that occurred naturally. Due to the small-scale pattern of timber harvest during the past several decades, large spatial "patches" that were historically common, are now replaced by smaller patches less typical of historical conditions (USDA 2003 p 11). Since 1980, patch sizes resulting from timber harvest in the Decision Area have ranged from 0.7 to 197 acres. These patch sizes are much smaller than those that have historically been created through natural processes. Crow and Gustafson (1997) found that harvesting 1 percent of the forest each decade using small openings resulted in less forest interior than harvesting 7 percent of the forest each decade using larger openings. They found that forest interior declines sharply with reductions in cutting unit size below approximately 50 acres.

How the Young Dodge Project Responds to Purpose and Need Statement C

The desired condition is to have larger patches that more closely represent natural conditions. Stand shapes and sizes would be designed to provide improved habitat to help sustain populations of wildlife species. The units proposed with the Young Dodge project will help trend toward patch sizes that reflect historic vegetation patterns. Some units will be large enough to develop into patches by themselves; others will be created by connecting past harvest units. The largest patch size proposed with this project would be approximately 390 acres. Activities that would help move existing conditions toward desired conditions include all harvest activities that tie existing units together. Over time these stands would mature as larger, similar stands or patches. This purpose and need statement is achieved in concert with meeting purpose and need statements A, B, or both. That is, patches will not be developed or enlarged unless it also meets the purpose of reducing fuel accumulations, restoring a more representative species composition, or reducing stand density.

The landscape would have linkage corridors that provide large blocks of connected habitat. Many of these areas are in or near riparian areas that provide for the highest plant and animal diversity of any habitat types. Additionally, due to the growing conditions in these riparian areas, the large-tree component is more available in these stands.

Social Factors

There are social factors that affect the resources and management of the Project Area. Like physical reference conditions, there are socially driven needs or desires that will be examined. These include providing an appropriate transportation system, recreation facilities, and special uses to meet the demands of the public, while protecting resource values. A segment of the population believes that product extraction and utilization also has its place, creating jobs (timber harvest, restoration work), wood products (commercial timber, biomass), and a viable resource management industry (infrastructure, local economies). The following have been identified as necessary considerations during this analysis:

- Transportation system
- Recreation facilities
- Special uses

The following discussion identifies *why* and *how* these social factors are important and their relationship to the Purpose and Need for Action. Changed social conditions have dictated a change in the way forest resources are managed. Social effects to other resources are described in more detail in Chapter III.

The Purpose and Need for Action is to:

D. Provide a transportation system that offers additional secure habitat for wildlife, reduces impacts to aquatic resources, and insures economical, necessary, and safe access to the forest

This Purpose and Need for Action statement addresses the first social factor (transportation system). Roads provide an important and necessary social function on the landscape. Access to the Project Area for recreationists, homeowners, resource managers, and commercial operations are important aspects to consider. Roads also have the potential to impact wildlife, water and air quality, and user safety. Therefore, it is critical that the road system be designed, maintained, and managed to maximize social benefits, while minimizing resource impacts.

How the Young Dodge Project Responds to Purpose and Need Statement D

The ID Team completed a roads analysis of the Project Area. Some roads were identified as no longer needed for present or future resource needs, and will be proposed to be decommissioned. Others not needed for the next 10 years or longer will be proposed for intermittent stored service. These actions will provide opportunities to increase big game security and grizzly bear core habitat, and reduce impacts to watersheds.

Most roads in the Project Area have been regularly maintained, are in good condition, and have met Best Management Practices (BMPs) in the past. However, additional maintenance will be proposed for roads or portions of roads in order for them to comply with current BMP standards. These BMPs will benefit water quality by controlling non-point source pollution and reducing the potential of sediment delivery to the stream network.

Additionally, several “unauthorized” roads were identified as part of the roads analysis. They are “unauthorized” only because they were not included in the Forest Transportation Atlas completed in 2005. These are existing forest roads that were determined as necessary for the protection, administration, and utilization of the National Forest System and the use and development of its resources. These roads will be proposed as additions to the National Forest Road System, and will become a permanent part of the transportation system.

A Travel Analysis for the Project Area was completed. The objective was to designate those roads, trails, and areas where motorized vehicle use will be permitted, including the types of vehicles and the season of use.

Minimizing the road system and upgrading existing road features is the most economical means of providing a safe access network to the forest. Fewer roads would reduce maintenance costs and increase wildlife habitat; upgraded, maintained roads have less failure risk during storm events. The combination of these is the desired condition.

E. Evaluate recreation facilities and opportunities to meet growing and anticipated demand

This Purpose and Need for Action statement addresses the second social factor (recreation facilities). In response to increased watercraft use and public requests for a boat launch on the west side of the reservoir, there is a need for improvements and access points. Currently, West Kootenai residents must trailer their boats nearly 40 miles round-trip to launch at Rexford boat ramp. Consequently, a boat ramp, parking area, and rest room are being proposed. The original EIS proposed a boat ramp and facilities at

Young Creek Bay. After discussions with the public, it was decided to analyze for a boat ramp at three locations including Poverty Creek, Sand Hill and Young Creek Bay. The analysis for the boat ramp at these three locations is found in Appendix 10.

Additional recreation opportunities include opening up an old trail (#238) to provide access to the Robinson Mountain trail (#59), eliminating the portion of the trail on Road #999, and improving the lookout on Mount Robinson and making it available for rent by the public. This work would improve the hiking experience, and make it possible to physically close Road #999 with a berm, thereby increasing grizzly bear core habitat. These improvements would move recreational facilities toward the desired condition.

F. Evaluate existing and proposed Special Use Permits

This Purpose and Need for Action statement addresses the third social factor (special uses). Corridors for utility lines (electricity and telephone) that cross NFS land to access private property have been proposed. The desired condition is to fully analyze these permitted uses, while reducing analysis costs.

PROPOSED ACTION

The Proposed Action (Alternative 1) is described in detail in Chapter II. It was designed by the ID Team to respond specifically to the Purpose and Need for Action. It would implement activities that contribute to moving the resources in the Project Area toward their desired future conditions.

DEVELOPMENT AND DESIGN OF THE PROPOSED ACTION

Nine strategies were developed to address the Purpose and Need for Action, which guided the selection of the activities that are contained in the Proposed Action:

Strategy 1. Reduce fuel accumulations: Regeneration and intermediate harvest (commercial thinning), along with post-harvest prescribed burning, would be used to decrease stand densities and fuel loads by altering fuel continuity and arrangement. This would reduce the risk of wildfires escaping initial attack and developing into stand-replacing wildfires, while helping improve the vigor of trees.

Underburning without timber harvest would be used in lower elevation areas to return fire as a process that historically maintained open forest conditions. It would be used in situations where conventional harvest methods cannot be used or are not needed, such as areas that are excessively steep with rocky soils and low product value, or where access is determined to be too difficult or distant given the limited volume or value of product. However, there may be limited opportunities to recover merchantable material such as biomass, posts and poles, or firewood. Slashing of small, unmerchantable trees may occur prior to burning to help achieve desired fire behavior and maintain the large overstory component through the underburning process.

Strategy 2. Restore characteristic vegetation patterns (vegetation species and stand structure): Intermediate harvest would be used to reduce stand density while retaining most large, fire-adapted trees. Regeneration harvest would be used to establish fire and disease-resistant species in proportions that reflect reference conditions. In the higher elevation stands, prescribed burning would be used to cause spruce and subalpine fir mortality, creating conditions favorable to re-establishing whitebark pine.

Strategy 3. Restore historic patch size, shape and distribution: Regeneration harvest would be used to increase or develop patch sizes that are more consistent with the historic disturbance patterns.

This strategy would be achieved in concert with Strategies 1, 2, or both. Patches will be developed or enlarged only as part of implementing Strategies 1, 2, or both.

Together, Strategies 1, 2, and 3 act as a surrogate for low and mixed-severity wildfire in the following ways:

- They reduce ground and ladder fuels, reducing the risk of stand-replacing crown fire for 15-20 years (Hvizdak 2003, personal communication with Lewicki);
- They retain a significant component of large diameter, long-lived, fire-adapted species (ponderosa pine, western larch, whitebark pine, and some Douglas-fir);
- They reduce overall stand density and lessen the percentage of fire-intolerant, drought sensitive and disease-prone species (Douglas-fir, subalpine fir);
- They prepare a seedbed for natural and artificial regeneration of long-lived, fire-adapted species (ponderosa pine, western larch, western white pine and whitebark pine); and
- As much as possible, these strategies would be used on the landscape in patterns that reflect historic disturbance size, shape and distribution.

Strategy 4. Bring roads up to BMP standards to reduce the amount of water and sediment delivered to streams: Roads needed to access areas proposed for vegetation management would be maintained to meet current BMPs. Maintenance could include installing ditch relief culverts, constructing drain dips or other structures to remove water from the running surface, improving stream crossings by increasing culvert sizes, and spot placing of aggregate to reduce surface rutting and sediment delivery.

Strategy 5. Decommission roads that are no longer needed: Roads identified by the ID Team as no longer needed for current and future administrative purposes would be removed from the NFS Road Inventory. Efforts would be made to stabilize and restore the roadbeds to a more natural state. The emphasis would be to restore the natural drainage patterns that were altered with the original construction of the road. Decommissioning activities could include complete or partial re-contouring of the roadbed, removal of culverts and other structures, placement of water bars, outsloping, stabilizing slopes and fills, seeding, and re-vegetating or a combination of the above.

Strategy 6. Place roads in intermittent stored service: A number of roads that are currently restricted to public motorized use yearlong were identified by the ID Team as not being needed for administrative use in the next 10-20 years. Most roads proposed for intermittent stored service are currently closed yearlong to public motorized vehicles.

Strategy 7. Add roads currently identified as "unauthorized" to the National Forest Road System: The roads were determined as necessary for the protection, administration, and utilization of the National Forest System and the use and development of its resources.

Strategy 8. Construct a boat ramp, parking area, and rest room: These projects, initiated through public input, would be accomplished as time and funding allows in response to changing trends in how and where the public wants to recreate.

Strategy 9. Improve the access to the Mount Robinson Lookout: An old trail would be reconstructed and the portion of the trail that utilizes approximately 1.5 miles of Forest Service Road #999 eliminated, thereby providing a shorter, more scenic access to the Mount Robinson area trail system.

The Mount Robinson Lookout would also be renovated and utilized as a rental lookout, if funding becomes available.

SUMMARY OF THE PROPOSED ACTION

The purpose of the Proposed Action is to restore and maintain sustainable ecological processes and improve forest health; reduce the risk of wildfires escaping initial attack and developing into large, stand-replacing fires; increase security for big game and other wildlife; reduce impacts to water resources; meet the recreation needs of forest users/visitors; and provide a sustained yield of timber volume responsive to local, regional, and national needs.

The Proposed Action would utilize vegetation management (timber harvest, prescribed burning, and reforestation), and access management (road maintenance, road storage, road decommissioning, and road reconstruction) to respond to the Purpose and Need for Action. It would implement management activities on approximately 6932 acres: timber harvest and post-harvest fuel treatment would occur on an estimated 2927 acres; prescribed burning without timber harvest would occur on an additional approximately 2047 acres; and prescribed burning with mechanical pre-treatment would occur on 1958 acres. An estimated 19,500 CCF (cubic hundred feet) or 9750 MBF (thousand board feet) of commercial timber products would be produced. Maintenance needed to meet BMPs would be performed on those portions of an estimated 117 miles of road requiring treatment. Approximately 12 miles of road would be decommissioned. An estimated 26 miles of road would be placed into intermittent stored service. Less than a half mile of road would be reconstructed and 8.85 miles of unauthorized roads would be added to the National Forest System Road Inventory.

A project-specific Forest Plan amendment to MA 12 Timber Standard #2 would be needed to allow harvest adjacent to existing openings in big game movement corridors. The Proposal contains seven new units adjacent to existing openings that currently do not provide hiding cover. This action would result in four large openings that would not provide hiding cover for big game, having areas greater than 600 feet from cover. The opening sizes would range from 131 to 390 acres within MA 12.

A project-specific Forest Plan amendment to Management Area (MA) 12 Fish and Wildlife Standard #7 would be needed to allow harvest in four new units that exceed 40 acres when combined with existing units. In total, nine units would create five openings greater than 40 acres or are greater than 600 feet to cover in MA 12.

A programmatic Forest Plan amendment to MA 12 Facilities Standard #3 would be needed to allow open road density to exceed 0.75 mi/mi^2 during project implementation and beyond.

The Proposed Action would result in nine harvest openings (15 units) greater than 40 acres, ranging in size from 48 to 383 acres. The creation of openings greater than 40 acres will require the approval of the Regional Forester.

The Proposed Action is designed to achieve the goals and objectives of the Kootenai National Forest Plan, and to meet all applicable laws and regulations including the National Environmental Policy Act, the National Forest Management Act, the Clean Water Act, the Endangered Species Act, the Clean Air Act, and the National Historic Preservation Act, among others.

SCOPE OF THE PROPOSED ACTION

The Proposed Action would result in timber sales to be sold between 2012 and 2016. Prescribed burning would begin following the end of harvest activities. Timber harvest activities would generally be expected to be completed by 2018, with slash disposal and reforestation activities completed by 2020. Management activities that would not involve timber harvest, such as prescribed burning with no timber harvest, would likely begin in 2013, and be completed by 2017, except for Unit 46, which would be completed by 2019. These dates are tentative, based upon anticipated budgets, work force, weather, and other considerations. Actual dates of implementation and accomplishment could vary.

SCOPE OF THE ANALYSIS

The Council of Environmental Quality regulations implementing the National Environmental Policy Act (NEPA) require that all federal agencies consider the following three types of actions in determining the scope of an environmental impact statement (40 CFR 1508.25):

Connected Actions are closely related and will be discussed in this FSEIS, along with the Proposed Action. Actions are considered connected if they automatically trigger other actions that may require NEPA analyses; if they cannot or will not proceed unless other actions are taken previously or simultaneously; or if they are an interdependent part of larger action and depend on the larger action for their justification.

Connected Actions are part of the Proposed Action. The Proposed Action includes all activities needed to complete the timber sales, prescribed burning, and road management while providing for resource protection during and following project completion. Connected actions contained in the Proposed Action include:

- Road reconstruction, road maintenance, and monitoring associated with contract administration.
- Road access management associated with harvest scheduling.
- Tree harvest and monitoring associated with contract administration.
- Prescribed burning, site preparation, and fuels reduction activities, including slashing, fireline construction, underburning, and fuel-moisture monitoring.
- Tree planting and monitoring of reforestation success.

Cumulative Actions include past, current, and Reasonably Foreseeable Actions that may have cumulatively significant impacts when considered along with the Proposed Action. The effects of these actions on NFS lands have been evaluated in the environmental analysis of the Proposed Action and its alternatives.

Three types of impacts are considered in the scope of the analysis: direct, indirect, and cumulative (40 CFR 1508.7 and 1508.8). They are defined in the introduction to Chapter III.

DECISIONS TO BE MADE

The Responsible Official (Decision Maker) is the Forest Supervisor of the KNF, who will decide the following:

1. Whether to harvest timber, and if so, the selection and site-specific location of appropriate timber management practices (silvicultural prescriptions, logging methods, riparian buffers, fuels treatment, reforestation and appropriate mitigation measures).

2. Whether to implement prescribed burning, and if so, the selection and site-specific location of appropriate prescribed burning practices.

3. Whether road access restrictions or other actions, including road maintenance, decommissioning, intermittent stored service, and reconstruction, are necessary to meet resource objectives, and if so, to what extent?

4. Whether to pursue developing additional recreational opportunities through construction of a boat ramp, parking area, and rest room and if so, where; and whether to provide an enhanced opportunity by eliminating part of Road #999, reconstructing a portion of trail #59, constructing vehicle parking for 2 to 3 vehicles with trailers at the new trailhead on road #7205, and improving the Mount Robinson lookout in order to make it available for rent by the public.

5. What, if any, project-specific monitoring requirements are needed to assure design criteria are implemented and are effective.

6. Whether project-specific Forest Plan amendments are needed in order to meet overall resource objectives, and if so, whether they are significant.

FSEIS ORGANIZATION

Chapter II – Alternatives: Describes the public involvement process used to identify the Significant Issues that were used to develop alternatives to the Proposed Action. Chapter II also contains descriptions of the Proposed Action and its alternatives, along with the alternatives that were considered but dropped from detailed study.

Chapter III – Affected Environment and Environmental Consequences: Provides the reader with an understanding of the existing condition and trends of resources in the Decision Area. The chapter also discloses the environmental consequences that would occur as a result of implementing each of the alternatives, including the No Action alternative. Direct, indirect, and cumulative effects are described, along with irreversible and irretrievable commitment of resources that may occur.

Chapter IV – Public Involvement: Provides the read with a description of the public involvement process for this project. This section also contains the comment letters received in response to the DSEIS and the Forest Service's response to these comments.

Appendices: Contain information that supplements the discussions presented in this FSEIS.

Project File: Contains Resource Specialists process papers, survey data, analyses, and supporting documentation used in the preparation of this assessment. It is available for review at the Eureka Ranger Station.

CHAPTER II – ALTERNATIVES

This chapter describes the public involvement history of the project, the Significant Issues, and the Alternatives, including the No Action alternative, the Proposed Action, and Alternatives to the Proposed Action. It also describes the Alternatives Considered but Dropped from Detailed Study.

CHANGES BETWEEN THE FEIS AND THE FSEIS

Alternative 1-Modified (1M): This alternative has incorporated comments from the Kootenai Forest Stakeholder Coalition (KFSC) received during the previous comment period and through subsequent meetings following the administrative appeal of this project. Unit 17 and a portion of Unit 21 have modified prescriptions that would be utilized in a research project directed by Dr. Terrie Jain from the Rocky Mountain Research Station in Moscow, ID. These units would test the "free selection" prescription in the cool/moist forest type. Other minor unit changes were based on further ground knowledge gained following the release of the FEIS and ROD in 2008.

Other Changes: Edits to the text of all the chapters were done to improve clarity and to update analyses due to the passage of time or updated information. Chapter 3 includes the analysis of effects of **Alternative 1-Modified**.

PUBLIC PARTICIPATION

The public involvement process for the Young Dodge project began on March 14, 2007 with an open house for residents of the West Kootenai, a community located in the eastern and northern portions of the Project Area. This was followed by an open house for the KFSC – Rexford District Project Group on March 15, 2007. A subsequent meeting with the KFSC was held on March 30, 2007.

On May 4, 2007, the Proposed Action was sent to individuals, organizations, American Indian tribes, and federal and state agencies for review and comment. Also on May 4, 2007, a letter summarizing the Proposed Action was sent to all landowners in the West Kootenai. The letter noted the availability of the scoping package and information on how to request it. Legal notices requesting public comment on the Proposed Action were published in the *Tobacco Valley News* and the *Daily Inter Lake* (paper of record) on May 10, 2007 and May 11, 2007, respectively. The Proposed Action and legal notices stated that the Proposed Action may require a project-specific Forest Plan amendment to a Management Area (MA) 12 standard to allow harvest in big game movement corridors; a project-specific Forest Plan amendment to a MA 12 standard to allow harvest in new units adjacent to existing units that are not providing suitable hiding cover; and a programmatic Forest Plan amendment to MA 12 Facilities Standard #3 to manage open road density at a level above 0.75 mi/mi^2 over the long-term. The notices also stated that the Proposed Action would result in openings exceeding 40 acres, requiring approval of the Regional Forester.

The cover letter that accompanied the Proposed Action and the summary letter, as well as the legal notices, stated that an open house would be held on May 16, 2007 followed by a field trip on May 17, 2007. An additional field trip with the KFSC was held on June 28, 2007.

On July 20, 2007, the Notice of Intent to prepare an EIS for the Young Dodge project was published in the Federal Register.

During April, July, and October 2007, the Forest published the Schedule of Proposed Actions that contained information on the Young Dodge project.

Eleven letters were received in response to the Proposed Action scoping letter; an e-mail and a letter were received following publication of the Notice of Intent. Comments received were reviewed and used to help determine Significant Issues. Refer to the Issue Development section of the Project File for information.

Comment letters were generally focused around six different themes. These included, but were not limited to, water quality, wildlife habitat, recreation, road access, scenic quality, and timber harvest. These comments were general concerns regarding the protection of resources (water quality, old growth habitat, scenic quality) and providing opportunities (boat ramp, road access, timber harvest).

Following the issue of the original Final Environmental Impact Statement and Record of Decision on May 1, 2008, the Record of Decision was administratively appealed to the Regional Forester per 36 CFR 215. The Regional Forester reversed the decision on July 24, 2008, citing insufficient evidence or rationale to explain why an analysis of potential effects on the goshawk was not warranted. Subsequently, the decision was made to issue this supplemental EIS in order to update the analyses and add the goshawk analysis to the project. The Notice of Intent to prepare a Supplemental Environmental Impact statement was mailed to the Office of the Federal Register on March 25, 2010. This notice was published on April 2, 2010.

The Notice of Availability of the Draft Supplemental Environmental Impact Statement was published in the Federal Register on June 18, 2010, in the Tobacco Valley News on June 17, 2010, and in the Daily Interlake (newspaper of record) on June 18, 2010. Letters requesting comment (dated June 1, 2010) were mailed to interested parties with either an electronic or paper version of document. Four comment letters were received. The response to these comments is included in Chapter 4 of this document.

On February 16, 2012, a letter was mailed to landowners in the West Kootenai requesting comment on three potential boat ramp locations. The Forest Service received 104 comments regarding this issue. A full analysis of the three potential boat ramp locations is located in Appendix 10.

ISSUE DEVELOPMENT PROCESS

The ID Team reviewed the comments received in response to the Proposed Action to identify Significant Issues that drive the development of alternatives to the Proposed Action. Some comments were determined to be beyond the scope of the Proposed Action; others were addressed by adherence to law, regulation, and policy or Forest Plan standards and guidelines; others were addressed by the development of Design Criteria or Alternative Features; and others were not supported by scientific or factual evidence.

Some comments were determined to be best addressed by developing alternatives to the Proposed Action. These are the Significant Issues that are described below. The alternatives to the Proposed Action, including those dropped from detailed study, are described on pages II-13 through II-28. The Resolution of Scoping Comments document, located in the Issue Development section of the Project File, shows how the scoping comments were categorized.

SIGNIFICANT ISSUES

Following are the Significant Issues identified from scoping comments and internal discussion**:**

Effects of regeneration harvest in big game movement corridors between existing openings in Management Area 12

Forest Plan MA 12 Wildlife and Fish Standard #7 states that harvest will "maintain big game movement corridors of at least two sight distances adjacent to existing openings in MA 12" (USDA Forest Service

1987a III-49). The Proposed Action includes a project-specific Forest Plan amendment to this standard to allow regeneration harvest in a number of big game movement corridors adjacent to existing openings. There are concerns that harvesting in big game movement corridors could affect the ability of animals to move freely between suitable habitat areas.

This issue was addressed by developing Alternative 3, where no harvest would occur within 600 feet of existing openings in MA 12.

Measurement Indicators: See Measurement Indicators for Effects of Large Openings in MA 12 issue below.

Effects of large openings in MA 12

Concern was expressed that openings resulting from regeneration harvest could affect wildlife, particularly big game species. Management Area 12 Wildlife and Fish Standard #7 states, "…but generally the unit sizes should not exceed: elk and mule deer 40 acres or less." Regeneration harvest contained in the Proposed Action would create a total of five openings (nine units) in MA 12 over 40 acres in size. Openings over 40 acres typically contain areas that are further than 600 feet from suitable hiding cover. Research shows that big game animals tend to use open areas greater than 600 feet from cover less than areas closer to cover (Thomas 1979). Creation of additional openings has the potential to isolate areas of habitat, and create barriers to movement for some wildlife species.

This issue was addressed by developing Alternative 3, which would reduce the size of regeneration harvest units in MA 12 to 40 acres or less or alter unit boundaries so that no point within the treatment units are greater than 600 feet from cover.

Measurement Indicators: Analysis will focus on the effects that regeneration harvest in forested cover or movement corridors have on wildlife species, primarily big game Management Indicator Species. Indicators are: 1) changes in the number of openings greater than 40 acres in MA 12 and all other non-winter MAs (15, 16); 2) changes in the amount of forage (cover/forage ratio) in MA 12 and other non-winter range MAs; and 3) number of movement areas removed between non-recovered units (units that do not provide hiding cover).

Effects of harvest in units in MA 12 adjacent to existing units that are not providing suitable hiding cover

Forest Plan MA 12 Timber Standard #2 states, "New units will not be harvested until adjacent units provide suitable hiding cover" (USDA Forest Service 1987a III-49). Regeneration harvest in the Proposed Action would occur in seven units adjacent to units that are not currently providing hiding cover. The Proposed Action includes a project-specific Forest Plan amendment to this standard allowing harvest in seven units creating four openings that are not providing hiding cover. There is a concern that harvesting these units could affect big game security.

This issue was addressed by developing Alternative 3. No harvest would occur in units adjacent to existing units not providing suitable hiding cover and no new treatment unit will contain points within their boundaries that are greater than 600 feet from cover.

Measurement Indicator: Number of movement areas removed between non-recovered units (units that do not provide hiding cover).

Effects of exceeding the MA 12 open road density standard

Forest Plan MA 12 Facilities Standard #3 states, "Roads open to public use will not exceed an average density of 0.75 miles per square mile within the contiguous MA" (USDA Forest Service 1987a III-51). The Proposed Action includes a programmatic Forest Plan amendment to allow open road density (ORD) to continue to be managed at the existing level of 0.81 mi/mi^2 during and following project implementation. The ORD would remain at this level following the completion of activities. There are concerns that maintaining ORD above 0.75 mi/mi^2 could reduce big game habitat use and security, and increase vulnerability and associated mortality.

This issue was addressed by developing Alternative 3. An additional 1.19 miles of Road #303, currently open yearlong, would be restricted yearlong. Road #7168, currently open yearlong, would have 0.17 miles restricted yearlong. These additional road restrictions would reduce the MA 12 ORD to 0.75 mi/mi^2 during project implementation and over the long-term.

Measurement Indicators: 1) ORD levels in MA 12 during project implementation; 2) ORD levels after project completion; and 3) habitat effectiveness during project implementation.

ACTIVITY DESCRIPTIONS

Following is a description of the activities incorporated into the action alternatives. The activities are designed to address one or more of the Purpose and Need for Action statements.

Vegetation Management

Each type of timber harvest proposed is designed to address one or more of the Purpose and Need for Action statements. These stand treatments are the specific tools utilized under ***Strategies 1, 2, and 3***, as described in the Development and Design of the Proposed Action in Chapter I.

Regeneration Harvest - Regeneration harvest is proposed for those stands where the objectives are to initiate a new stand that is more resistant to insect and disease attack, to reduce fuel accumulations, and to capture the economic value of dead and dying trees. Five products of this treatment include 1) the restoration of landscapes composed of long-lived, seral species and fire adapted forest structures; 2) a change in the arrangement and continuity of fuels on a large scale, reducing the risk of wildfires escaping initial attack; 3) the development of effective fuel breaks through the strategic use of large openings; 4) reduced fragmentation, an increase in forage, and the development of large blocks of big game security habitat in 10-15 years; and 5) improved scenic integrity by decreasing geometric patterns in existing units, blending these small existing units into larger openings that emulate natural patterns. These treatments respond to ***Purpose and Need statements A, B, and C,*** and relate to ***Strategies 1-3***. Stands have been identified for regeneration harvest for the following reasons:

1. Stands have sustained moderate to heavy mortality and are too under-stocked to implement intermediate harvest methods. This mortality is due to Douglas-fir bark beetle in Douglas-fir; mountain pine beetle in lodgepole pine; a variety of endemic sources, such as stem breakage due to stem decay in dense, older stands composed primarily of Douglas-fir, subalpine fir, spruce, and lodgepole pine that are declining in vigor,; or a combination of these factors.

2. Stands that are largely composed of thin-barked, shallow-rooted species such as subalpine fir, spruce, and lodgepole pine are not conducive to intermediate harvest methods. These species are easily damaged during harvest operations, and are not wind-firm or fire-resistant.

3. Root disease is prevalent and the stand has a significant percentage of susceptible species.

While regeneration harvest would retain most fire-resistant overstory trees, the number of trees remaining would vary, largely dependent on their number and condition (vigor/fire hardiness) prior to harvest. Patches developed by regeneration harvest would move toward naturally occurring opening size and patterns. Patch sizes of 50-5000+ acres, with most in the 400-600 acre range, are characteristic of the disturbance patterns in the Project Area (USDA Forest Service 2002b). Regeneration harvest would fit into one of the following categories:

Shelterwood with reserves (variable density, dispersed moderate retention[2]) – An even-age silvicultural system where a new age class develops from seeds that germinate in a moderated micro-environment provided by 10-40 residual trees per acre. Seed trees would be designated by species/diameter designation, so their dispersal would be variable and would mirror the existing distribution. Coarse woody debris would be left on-site to attain the levels indicated in Soils Table 3-7. All snags not posing a hazard during harvest operations would be left on-site. All seed trees would be retained indefinitely. Hand planting may be used to supplement tree numbers or increase the component of western larch, ponderosa pine, or western white pine.

The objective of this treatment is to produce an even-age stand with two canopy levels, and to provide snag replacements. Leave trees would generally be thick-barked, fire-resistant species such as ponderosa pine and western larch.

Shelterwood harvest would result in removal of 60- 75% of the canopy of the stand (See Figure 2-1).

A. B.

Figure 2- 1 Examples of shelterwood with reserves units on the Rexford Ranger District. Example A is a unit 2 years after site preparation. Example B is a photograph of a two storied stand developing from a shelterwood system.

Seed Tree with Reserves (variable density, dispersed retention) – An even-age silvicultural system where a new age class develops from seeds that germinate in a fully-exposed micro-environment after removal of nearly all of the previous stand, except for 8-20 trees per acre left to provide seed. Coarse woody debris would be left on-site to attain the levels indicated in Soils Table 3-7. All snags not posing a hazard during harvest operations would be left on-site. All mistletoe-free seed trees would be retained indefinitely. Hand planting may be used to supplement tree numbers or increase the component of western larch, ponderosa pine or western white pine.

[2] [2] Retention terminology analogous to that found in Franklin et al 1997.

The objectives of this treatment are to produce an even-age stand with two canopy levels, with a variable dispersal of leave trees that provides for future snag recruitment. Leave trees would generally be thick-barked, fire-resistant species such as ponderosa pine, western larch, and Douglas-fir 14 inches or greater diameter at breast height (DBH).

Seed tree harvest would result in approximately 85-90% canopy removal (see Figure 2-2).

A.

B.

Figure 2- 2 Example of seed tree with reserve units on the Rexford Ranger District. Example A is a seed tree system 2-3 years after site preparation (underburning). Example B is a two storied stand developing from a seed tree system.

Clear Cut with Reserves - An even-age silvicultural system where nearly all trees are harvested in one entry and a new stand is developed in a fully-exposed micro-environment through natural seeding, hand planting, or a combination of the two. Five to twelve trees per acre would be left to meet reserve tree standards for snags or snag replacement.

Clear cut harvest would result in removal of approximately 95% of the canopy of the stand (see Figure 2-3).

Coarse woody debris would be left on-site to attain the levels indicated in Soils Table 3-7. All snags not posing a hazard during harvest operations would be left on-site. All mistletoe-free seed trees would be retained indefinitely. Hand planting may be used to supplement tree numbers or increase the component of western larch, and western white pine. Reforestation would be designed to reforest the units within a five-year time period using a mixture of native tree species appropriate to the specific site.

A.

B.

Figure 2- 3 Examples of clearcut with reserve units on the Rexford Ranger District. Example A is a clearcut with reserves on a dry, low-elevation site. Example B is in a high elevation stand. Note 1-3 foot tall seedlings in the foreground of both examples.

Intermediate Harvest - Intermediate harvest would be used to modify stand structure, density, or species composition to improve vigor and stand resistance to insect and disease occurrence. It would also be used to reduce fuels prior to prescribed burning, and to recover the economic value of dead and diseased trees. The five products described under Regeneration Harvest above would apply here, but to a lesser degree. These treatments respond to ***Purpose and Need statements A, B, and C,*** and relate to ***Strategies 1-3***.

Intermediate harvest is proposed for stands: 1) where fuel reduction and density control are desirable; 2) that have no known root disease occurrence that can be worsened by intermediate harvest; 3) that have stand compositions that would allow partial harvest and fuels reduction activities without excessive damage to the residual stand; and 4) where objectives can be achieved while leaving a fully stocked stand that is windfirm and expected to remain intact. Stands proposed for intermediate harvest generally contain a high proportion of Douglas-fir, ponderosa pine, and western larch. These species are windfirm and have thick bark that protects them during prescribed burning operations. Underburning would be used to further reduce ground and aerial fuels.

There are three types of intermediate harvest proposed: commercial thin, roadside salvage, and post and pole harvest.

Commercial Thin (variable density, moderate dispersed retention) – A silvicultural treatment where subordinate trees from all crown classes are harvested to reduce stand density.

The primary objectives of this treatment are to improve stand vigor, enhance forest health, and recover the economic value of imminent mortality. The residual stand would be considered adequately stocked to meet most management objectives. In some situations, regeneration may be initiated, but the new cohort would not be actively managed; the major emphasis would be on the residual stand. In units with little or no dwarf mistletoe infection and vigorous trees, leave trees would be designated by species/diameter, so their dispersal would be variable, mirroring the existing distribution. In units where the overstory varies in vigor and is infected with dwarf mistletoe the most vigorous and lightly infected trees would be marked for retention. Dispersal of these leave trees would be somewhat variable because designation would be based on leaving the most vigorous trees at a given basal area and not on a designated spacing

Commercial thinning would result in approximately 50% canopy removal (see Figure 2-4).


A.


B.

Figure 2- 4. Examples of commercial thinning on the Rexford Ranger District. Example A is a commercial thinning in a low-elevation ponderosa pine stand. Example B is in a mid-elevation western larch stand.

Roadside Salvage – This treatment would remove dead trees up to a distance of 150-200 feet from either edge of the road. Fuels would be lopped and scattered or machine piled and burned. Little-to-no canopy reduction would occur. A cable harvest system (such as a tractor with winch) would be used, and all equipment would be restricted to the existing road surface.

Post and Pole Harvest – This treatment consists of harvesting small diameter lodgepole pine trees in stagnant stands to be used for fencing and/or furniture. The treatment would result in a mosaic stand. Fuels would be lopped and scattered or machine piled and burned. A post and pole harvest would appear similar to a commercial thin.

Salvage of Incidental Mortality from Underburning –While prescribed burning is designed to minimize the risk of mortality in leave trees or adjacent stands, incidental mortality to individual trees and small patches of trees within, or adjacent to, prescribed burns, could occur. Mortality could be salvaged from either units that were harvested and underburned, or from units that were underburned without harvest. Salvage would likely occur 1-2 years following burning to reduce merchantability loss.

Salvage of trees dying or killed by prescribed burning could occur within the Project Area, subject to the following conditions: 1) leave islands designed to provide cover would be left; 2) adequate levels and distribution of coarse woody debris would be retained after salvage; 3) Rexford Ranger District snag level guidelines would be met; 4) no salvage would occur in areas of known nest trees, den sites, or other specialized habitats as determined by the project's Wildlife Biologist; 5) no salvage would occur within Riparian Habitat Conservation Areas; 6) existing skid trails and roads would be utilized to the extent possible. If additional skid trails are necessary, they would be designated to minimize soil disturbance; 7) harvest would occur only within Forest Plan MAs that allow salvage; 8) no new road construction would occur; 9) Forest Plan open road densities would be met as amended; 10) cultural resource and sensitive plant surveys would be completed, and salvage would not impact known cultural sites or sensitive plant populations; 11) no salvage would occur within identified wetlands; 12) all other design criteria specified in the decision would be met; 13) salvage is limited to areas within or adjacent to treatment units; 14) salvage activities would only occur in Lynx Analysis Units if they were in compliance with the Northern Rockies Lynx Management Direction (USDA 2007) standards for salvaging fire-killed trees; 15) post-salvage activity fuels would be treated through excavator piling, jackpot burning, or other accepted methods of fuel treatment; and 16) cumulatively, no more than 200 acres of fuel reduction-related salvage could occur during the planning period; approximately 20 acres/year. Salvage of incidental mortality from burning would appear similar to the treatment in the unit where the salvage occurs.

Regeneration/Intermediate Mosaic – Regeneration/Intermediate harvest mosaic combinations are proposed for stands where levels of fire/disease/insect- resistant trees are very variable. The objective is to retain a healthy fire/insect/disease-resistant overstory, and regenerate areas where this type of overstory is sparse. Western larch and ponderosa pine are species historically dominating most fire-resistant overstories, with lesser amounts of Douglas-fir (USDA Forest Service 2002b; Arno et al 1995; Arno et al 1997; Blume 2003). These are the species that would be retained in the overstories.

Regeneration/intermediate combinations would fall into one of the following categories:

Seed tree/Shelterwood/Commercial Thin mosaics (variable density, light to moderate dispersed retention) – A combination of silvicultural treatments where fire-resistant trees are retained and most fire-susceptible trees are harvested. Residual tree densities would vary between 6-40 trees per acre throughout the unit.

The primary objective of this treatment is to sustain large, fire-resistant trees through time by removing fire-susceptible trees that are competing with, and decreasing the vigor of, the fire-resistant trees. These fire-susceptible trees are also serving as ladder fuels that increase the potential for stand-replacing crown fires. Regeneration may be initiated in many portions of the stand, but would be managed only in areas three acres or larger where residual tree density is low enough to permit adequate development of the new cohort. In units with little or no dwarf mistletoe infection and vigorous trees, leave trees would be designated by species/diameter designation, so their dispersal would be variable, mirroring the existing distribution. In units where the overstory varies in vigor and is infected with dwarf mistletoe, the most vigorous and lightly infected trees would be marked for retention. Dispersal of these leave trees would be somewhat variable because designation would be based on leaving the most vigorous trees at a given basal area and not on a designated spacing.

Coarse woody debris would be left on-site to attain the levels indicated in Soils Table 3-7. All snags not posing a hazard during harvest operations would be left on-site. All mistletoe-free seed trees would be retained indefinitely. Hand planting may be used to supplement tree numbers or increase the component of western larch, ponderosa pine or western white pine.

A seed tree/shelterwood/commercial thin mosaic (mosaic) would result in an average removal of 60-70% of the canopy of the stand. The visual appearance of a mosaic unit within the unit itself would range from a seed tree with reserves to a commercial thinning (see Figures 2-2 and 2-4).

Irregular selection "Free-Selection" (variable density, light to moderate retention, dispersed and aggregated) – A combination of commercial thinning, group, and single tree selection systems with reserve trees left in all structural stages. The objective is to maintain cover and to develop a clumpy and irregular stand structure. Because it is largely an uneven-aged system, it utilizes multiple tending and regenerating entries at various intervals to develop and maintain the desired forest conditions. Similar to traditional uneven-aged systems, the full range of silvicultural methods from regeneration to thinning can occur at each entry, if needed (Jain et al 2004). Free selection would result in removal of 40-60% of the stand canopy. The visual appearance of a free selection unit would range from a seed tree with reserves to a commercial thinning (see Figures 2-2 and 2-4). Leave trees would be designated by marking, with a variable retention and spacing being specified based on existing stand conditions.

Fuel Treatment

These treatments are the specific tools utilized under ***Strategies 1, 2, and 3***, as described in Chapter I.

Underburning with Harvest – The objective is to reduce fuel loads, both natural and those resulting from harvest, and to prepare sites for regeneration. This type of burning occurs under leave trees. These treatments respond to ***Purpose and Need statement A*** and relate to ***Strategy 1***.

In addition to underburning, the following types of prescribed burning would be used to reduce fuel loads resulting from timber harvest:

Excavator Piling and Burning - This would be done where fuel concentrations are high and resources, such as snags or leave trees, need to be protected in the harvest units. With this type of fuel treatment, logging slash is concentrated in piles using an excavator. The piles are generally burned in the fall when the chance of fire spreading is minimal. These units may be underburned following pile burning to achieve other objectives for the stand (e.g. treating fine fuels, stimulating browse). On Commercial Thin units, 25 percent of acres may be piled and burned. Fifty percent of Prescribed Burn with Mechanical Pre-treatment units may be piled and burned. Units where this treatment occurs are not found in Table 2-1 under “excavator piling”, but they are accounted for in the “underburn following timber harvest” category.

Lop and Scatter/Excavator Pile – These are mechanical methods that change the fuel profile during harvest or thinning activities. They are used to minimize scorch heights and tree mortality within some stands during prescribed burning activities. Fuels are distributed across the unit in areas where pretreatment fuel loads are lighter. In areas of heavier fuel loads or where activity fuels create a substantially heavier fuel load, excavator piling is utilized to reduce the overall fuel load on site. Excavator piles are subsequently burned under favorable conditions. In some cases this may be the only fuel treatment to occur in a unit. This fuel treatment would occur on the post and pole and roadside salvage units.

Underburning without Harvest - This treatment would be implemented in units where conventional harvest methods cannot be used prior to burning or where existing stand conditions and fuel loads would allow for the use of prescribed fire to achieve desired stand conditions without the removal of excess fuels. Examples would include areas that are excessively steep with rocky soils and low product value, or where access is difficult due to the terrain. These treatments respond to ***Purpose and Need statements A and B***, and relate to ***Strategies 1 and 2***. Two types of this treatment are described as Ecosystem Burn and Maintenance Burn.

Prescribed Burn with Mechanical Pre-treatment - This treatment would be used to accomplish a variety of resource objectives where the stand densities, topography, proximity to private land, or visual concerns preclude the use of underburning without mechanical treatment. Some non-merchantable and merchantable products, including but not limited to, the bio-mass utilization of chips, tops, firewood, and poles, may be removed, except in MA 13 (old growth). This product removal, where it occurs, would not be the primary intent of the unit, but a by-product that would be dictated by markets and the desire of the operator to remove the material. Selective slashing could follow product removal, which may be excavator piled and burned. Piled slash would generally be burned in late fall after receiving adequate moisture to reduce the spread of fire in open areas and before the piled material becomes too wet to burn. Underburning could occur within 1-5 years after initial treatment. Up to 50% of these acres may be piled and burned prior to underburning. Piling would occur in portions of some units where fuel loads would cause high levels of mortality in the residual stand.

Prescribed Burn Only (Maintenance) - A type of prescribed burn that occurs 10-25 years following initial fuels treatment used to reduce the natural fuel loads that have accumulated over time. This treatment is typically used in vegetation types with frequent fire return intervals, such as ponderosa pine or grass.

Stands proposed for these treatments are typically composed of mature ponderosa pine, Douglas-fir, and western larch, with an understory of dense Douglas-fir. Some stand density and species composition control would be accomplished as burning kills some of the smaller, unmerchantable and less fire-tolerant species. Some slashing of small, unmerchantable trees may occur prior to burning to help achieve desired fire behavior and to maintain the large overstory component.

Prescribed Burn Only (Ecosystem Burn) - The objective is to return fire to stands where it historically maintained more open forest conditions. It would be used to reduce ground and ladder fuels and encroaching understory growth by burning at low-to-moderate fire intensities, similar to those that likely occurred naturally.

This treatment could occur in several different fire regimes. It is used to achieve multiple objectives including, but not limited to, shrub and browse rejuvenation, fuels reduction, and changes in stand density and composition. This treatment typically occurs over large areas.

Road Management

There are five types of road management activities: Road maintenance, road decommissioning, intermittent stored service, road reconstruction, and NFSR additions. These activities respond to ***Purpose and Need statement D*** and relate to ***Strategies 4, 5, 6, and 7.***

Road Maintenance – This is the ongoing upkeep of a road necessary to meet the approved road management objectives (RMOs). The present focus of RMOs is to meet the current Best Management Practices (BMPs) for each road. The BMP objectives for road maintenance are to: reduce the concentration of sub-surface and surface water runoff; minimize road surface erosion; filter ditch water before entering streams; and decrease the risk of culvert failures during peak runoff events. Maintenance work could include, but would not be limited to: culvert installation, replacement of existing culverts with larger diameter culverts, installation of drainage dips or surface water deflectors, placement of riprap to armor drainage structures, replacement of aggregate surfaces, placement of aggregate to reinforce wet surface areas, ditch construction and cleaning, and surface grading to restore the drainage efficiency of road surfaces. These actions would bring the roads up to current BMP standards and provide benefits to the streams in the Project Area. The proposed work would not only reduce the effects of non-point source sediment to streams, but would also help reduce the risk of effects due to peak flow runoff events.

A map displaying the roads identified for BMP maintenance within each alternative is shown on individual alternative maps. Tables listing the roads, their mileage, and their funding source for treatment are located in the Transportation section of the Project File.

Road Decommissioning – Roads no longer needed for current or future resource management would be decommissioned. Decommissioning would stabilize and restore the road prisms to a more natural state by restoring the pre-construction drainage patterns. The resulting long-term reduction in impacts produced by these roads would benefit the streams in the Project Area. Decommissioning would also reduce the costs of maintaining the roads.

The methods to be used for decommissioning would be determined on a site-specific basis, and could include the following: full re-contouring to restore the original ground slope, partial re-contouring to fill ditches or remove unstable road shoulders, removing culverts and other drainage structures, ripping the roadbed to reduce compaction, installing water-bars, out-sloping the road prism, seeding and fertilizing disturbed soil, or blocking the road entrance and abandoning the road to allow re-vegetation.

Intermittent Stored Service – The objective of intermittent stored service is to reduce the risks, impacts, and maintenance costs associated with roads that are not needed for a period of 10 to 20 years.

These roads are typically restricted to public motorized vehicle use yearlong, but they continue to affect water quality and wildlife security, and incur maintenance costs. Placing roads into storage would benefit these resources and result in lower maintenance costs.

Actions to accomplish placing a road into intermittent stored service status include removing culverts on live, intermittent, and ephemeral streams, restoring stream crossings and natural drainage patterns, out-sloping the road surface, removing unstable material at seeps and slumps, installing water bars and cross-drains, and seeding disturbed sites. The road prism remains on the landscape for long-term future resource management.

The advantage of placing a road into stored status rather than decommissioning it is that the road remains a National Forest System Road (NFSR). A decommissioned road is no longer considered a road, and is not to be considered for future use.

Road Reconstruction – Reconstruction is an activity that results in improvement (a change from original standards) or realignment of an existing road. Realignment is the activity that results in a new location of an existing road or portions of an existing road and treatment of the old roadway.

Approximately 0.40 miles of Road #7176A would be reconstructed as part of the overall project to install a boat launch in Young Creek Bay. The road would be improved to handle a higher volume of traffic and realigned to resolve existing problems and reduce maintenance costs.

Road Additions to the NFSR – The following existing roads were determined as necessary for the protection, administration, and utilization of the National Forest System and the use and development of its resources. Roads 14004, 14076, 14082, 14274A, 14924, 14926, 14927 from MP 0.47 to 0.58, 14994, 15624A, 474P, 474R, 474S, 7175A, 7220A from MP 1.36 to 1.85, 7220E, 7222K, 7225, 7225A, 7972B, and 7972C, totaling 8.85 miles, are presently “unauthorized” roads because they were not included in the Forest Transportation Atlas composed in 2005. These roads would be proposed as additions to the NFSR, and would become a permanent part of the transportation system.

Recreation Facilities and Special Uses

These activities respond to ***Purpose and Need statements E and F*** and relate to ***Strategies 8 and 9***. These potential projects are being analyzed now, but may be accomplished as funding allows.

Construction of a boat ramp, parking area, and restroom – In response to public input, a boat ramp facility is proposed to provide a reservoir access point for the west side of Koocanusa Reservoir. Three potential locations have been identified, including Poverty Creek, Sand Hill and Young Creek Bay.

Robinson Mountain Trail - The trailhead for the Robinson Mountain trail (#59) is currently located at the junction of Road #999 and #7205. This non-motorized trail would be rerouted to the old South Fork of Young Creek Trail #238 northwest on Road #7205 approximately 1.5 miles from the present location. This re-routing would reduce the overall trail length by 1.5 miles. Road #999 would be placed into intermittent stored service. Minor reconstruction of Trail #238 would be necessary, with trailhead signs and the construction of vehicle parking for 2 to 3 vehicles with trailers at the new trailhead location. These improvements would be necessary to bring the trail up to forest standards.

Robinson Mountain Lookout – Renovation of the Robinson Mountain Lookout is proposed in order to provide another rental lookout cabin for the Forest. Currently, other lookouts on the District are heavily utilized and this site would provide additional rental opportunities.

Special Use Permits – Several types of special use permits will expire during the life of this project (10 years). To analyze these permits efficiently, as well as cumulatively, they are being considered at this time. Permits would still be reauthorized individually, as they expire. However, the analysis will have been completed. This analysis includes the all existing utility lines, a gravel pit, fire station, irrigation and water lines, a fish weir, and access to private property (rights-of-way).

ALTERNATIVES

This section will describe the No Action alternative, the Proposed Action, and the alternatives to the Proposed Action, which were developed based on the Significant Issues identified in response to scoping comments and internal discussion. It describes the alternatives considered but dropped from detailed study. Information pertaining to the development of the Proposed Action and its alternatives is located in the Alternative Development section of the Project File.

ALTERNATIVES CONSIDERED IN DETAIL

Three alternatives were considered in detail by the ID Team: Alternative 1 is the "Proposed Action," Alternative 1M is an action alternative that includes some harvest for research purposes, Alternative 2 is the "No Action" alternative, and Alternative 3 is an "action" alternative that proposes management activities that meet all Forest Plan direction, standards, and guidelines.

Alternative Descriptions

The following section describes the activities associated with each alternative. The alternatives differ in their emphasis and approach to managing resources within the Project Area. Resource outputs resulting from implementation of the alternatives are listed. Summary table numbers are rounded; please refer to the Alternative Unit Tables for more precise figures.

Alternative 1 - Proposed Action

The Proposed Action was developed to specifically respond to the ecological and social factors identified in the Purpose and Need for Action. It utilizes active management to move existing conditions toward desired future conditions. This alternative addresses the five ecological and three social factors identified in Chapter I, providing a range of forest products and recreational experiences, while maintaining a sustainable environment for the long-term.

Alternative 1 would require two project-specific Forest Plan amendments and one programmatic amendment. Additionally, it would require the approval of the Regional Forester to create openings exceeding 40 acres. Table 2-1, below, lists the features of Alternative 1.

The Forest Plan amendments are as follows:

1) MA 12 Wildlife and Fish Standard #7 to allow regeneration harvest that exceed 40 acres when combined with existing units (openings);

2) MA 12 Timber Standard #2 to allow harvest adjacent to existing openings in big game movement corridors; and

3) MA 12 Facilities Standard #3 to allow an open road density to exceed an average density of 0.75 miles per square mile within the contiguous MA. This is a programmatic amendment under this alternative to allow for the long-term management of a higher road density in MA 12 within the Young Dodge project area.

Table 2- 1 Features of Alternative 1

Vegetation Management:	**6932 acres**
Shelterwood with Reserves	0 acres
Seed Tree with Reserves	1822 acres
Clear Cut with Reserves	34 acres
Commercial Thin	664 acres
Seed Tree/Shelterwood/Commercial Thin Mosaic	15 acres
Free Selection	0 acres
Roadside Salvage	334 acres*
Post and Pole Harvest	58 acres
Prescribed Burn with Mechanical Pre-treatment	1958 acres
Prescribed Burn Only - Maintenance	1236 acres
Prescribed Burn Only – Ecosystem	811 acres
Salvage of incidental mortality associated with prescribed burning	200 acres**
Harvest Volume	**19,502 CCF (9751 MBF)**
Fuel Treatment:	**6932 acres**
Underburn following timber harvest	2535 acres
Prescribed Burn with Mechanical Pre-treatment	1958 acres
Lop and Scatter/Excavator Pile	392 acres
Prescribed Fire Only – Maintenance	1236 acres
Prescribed Fire Only – Ecosystem	811 acres
Road Management:	
Road Maintenance (BMPs)	100 miles ***
Roads to be decommissioned	12 miles
Road to be placed in intermittent stored service	27 miles
Reconstruction (realignment) of existing roads	0.40 miles
Unauthorized roads proposed as additions to the NFSR	9 miles
Other Activities	
Miles of trail re-routing	1.5 miles
Number of special use permits analyzed	22 permits
Construction of a boat ramp and associated facilities	Yes

* Not all 334 acres would be harvested due to suitability of some areas

** Up to 200 acres may be harvested depending upon whether mortality occurs

*** Not all 100 miles would be treated; only those portions of roads requiring work would be treated, 17 additional miles of BMP work could be completed outside the Decision Area

FEATURES OF ALTERNATIVE 1

Detailed information on the proposed units is contained in Table 2-2, pages II-18 to 19. A map of Alternative 1 is shown on MAP 2-1. The shapes of the proposed harvest units are for representation purposes only; actual unit boundaries may be modified during sale layout to conform to natural patterns or identifiable landmarks on the landscape.

Vegetation Management

Each type of timber harvest proposed in Alternative 1 is designed to address one or more of the Purpose and Need for Action statements. These stand treatments are the specific tools utilized under ***Strategies 1, 2, and 3***, as described in the Development and Design of the Proposed Action in Chapter I.

Regeneration Harvest – Regeneration harvest in this Alternative would fit into one of the following categories:

Seed Tree with Reserves (variable density, dispersed retention) – See description on pages II-5 and 6. In Units 17, 23, 25, 29, 30, 38, 40, and 129 seed trees would be selected by species and/or diameter. Leave trees would be variably dispersed to mirror the existing distribution. In Units 12, 19, 21, 53, 112, 211, and 212 the overstory is of low vigor and/or infected with dwarf mistletoe. In these units, the healthiest trees would be marked for retention.

This alternative would implement a seed tree with reserves prescription on 15 units totaling 1822 acres.

Clear Cut with Reserves – See description on page II-6. Clearcutting was prescribed for Unit 138 because there is a lack of fire-tolerant leave trees and bark beetle mortality has reduced the stocking by 80%. Reserves would be variably dispersed because of species and/or diameter designation, mirroring the existing distribution. Trees retained on this site would not serve as seed trees, but would serve as snags and snag replacements.

This alternative would implement a clear cut with reserves prescription on one unit totaling 34 acres.

Intermediate Harvest – Alternative 1 uses three types of intermediate harvest: commercial thin, roadside salvage, and post and pole harvest.

Commercial Thin (variable density, moderate dispersed retention[1]) – See description on page II-7. In Units 16 and 116, leave trees would be designated by species and/or diameter to mirror the existing distribution. In Units 2, 6, 24, 47, and 220 the overstory varies in vigor and is infected with dwarf mistletoe.

Unit 15, originally included in Alternative 1, was dropped as a harvest unit and is now a precommercial thinning unit considered in the Rexford Ranger District's 2009-2010 precommercial thinning program (see Current and Reasonably Foreseeable Actions Table 1-2 in Chapter 1).

This alternative would implement a commercial thinning prescription on seven units totaling 664 acres.

Roadside Salvage – See description on pages II-7 and 8. Units 50 and 51 are designated as roadside salvage units in response to public comments and the heavy lodgepole pine mortality occurring in the vicinity of roads 303, 303J, 303L, 3632, 3632D, and 3632E.

This alternative would implement a roadside salvage prescription on two units totaling 334 acres.

Post and Pole Harvest – See description on page II-8. Unit 49 is designated as a roadside salvage unit in response to public comments and extreme overstocking of lodgepole pine occurring in the vicinity of road 303.

This alternative would implement a post and pole prescription on one unit totaling 58 acres.

Salvage of Incidental Mortality from Underburning – See description on page II-8. While prescribed burning is designed to minimize the risk of mortality in leave trees or adjacent stands, incidental mortality to individual trees and small patches of trees within, or adjacent to, prescribed burns, could occur. Alternative 1 would allow some of this mortality to be salvaged, both from units that were harvested and underburned, and from units that were underburned without harvest. Salvage would likely occur 1-2 years following burning to reduce merchantability loss.

Regeneration/Intermediate Mosaic – Regeneration/intermediate combinations proposed by Alternative 1 fall into one category:

Seed tree/Shelterwood/Commercial Thin mosaic (variable density, light to moderate dispersed retention[1]) – See description on pages II-8 and 9. In Unit 201 leave trees would be designated by species and/or diameter to mirror the existing distribution.

Fuel Treatment

Underburning with Harvest – See description on page II-9. Underburning with harvest would fit into 2 of the following categories:

> ***Excavator Piling and Burning*** - See description on pages II-9 and 10. Portions of 18 units totaling 1145 acres would be excavator piled and burned. .
>
> ***Lop and Scatter/Excavator Pile –*** See description on page II-10. A lop and scatter/excavator pile treatment would be implemented on three units totaling 392 acres.

Underburning without Harvest - Two types of this treatment are described as Ecosystem Burn and Maintenance Burn.

> ***Prescribed Burn with Mechanical Pre-treatment*** – See description on page II-10. This treatment would be implemented on eleven units totaling 1958 acres.
>
> ***Prescribed Burn Only (Maintenance) –*** See description on page II-10. Maintenance burning would be implemented on four units totaling 1236 acres.
>
> ***Prescribed Burn Only (Ecosystem Burn)*** – See description on pages II-10 and 11. Ecosystem burning would be implemented on four units totaling 811 acres.

Road Management

Alternative 1 proposes five types of road management activities: Road maintenance, road decommissioning, intermittent stored service, road reconstruction, and NFSR additions. These activities respond to ***Purpose and Need statement D*** and relate to ***Strategies 4, 5, 6, and 7.***

Road Maintenance – See description on page II-11. Approximately 100 miles of existing road surface would be maintained in the Project Area by these methods.

A map displaying the roads identified for BMP maintenance is shown in MAP 2-1. Tables listing the roads, mileage, and funding source for management activities are located in the Transportation section of the Project File.

Road Decommissioning – See description on page II-11. Forty roads (all of #14019, 14020, 14022, 14047, 14062, 14075, 14922, 14927A, 470F, 474D, 7173D, 7189C, 7211A, 7211C, 7212B, 7212D, 7213D, 7218E, 7218Z, 7220B, 7220C, 7220D, 7220F, 7220K, 7221, 7222A, 7222F, 7222G, 7222J, 7233A, 7816F, 7972D; and portions of #14925, 14927, 15606H, 15624C, 7211B, 7218A, 7219A, and

8000D), totaling 12.25 miles, would be decommissioned. Of these roads, 8.81 miles are currently restricted yearlong to public motorized vehicle use; the remaining 3.54 miles are currently open or seasonally open. As a result of the Roads Analysis Process, the ID Team determined that these roads would no longer be needed for resource management or administration. Decommissioning would be required under timber sale contracts or accomplished with appropriated funding.

Intermittent Stored Service – See description on pages II-11 and 12. Thirty-five roads (all of #14004, 14026, 14076, 14081, 14296, 14926, 14994, 474G, 474H, 474K, 474P, 474R, 474S, 7168A, 7168B, 7168C, 7168H, 7175A, 7202A, 7205P, 7205R, 7212C, 7219B, 7220J, 7222B, 7222C, 7222K, 7225A, 999, and 999A; and portions of #303, 303J, 474F, 7218B, and 7225), totaling 27.02 miles, would be placed into intermittent stored service. Currently 0.46 miles of these roads are open; the remaining 26.56 miles are restricted yearlong.

Road Reconstruction – See description on page II-12. Approximately 0.40 miles of Road #7176A would be reconstructed as part of the overall project to install a boat launch in Young Creek Bay. The road would be improved to handle a higher volume of traffic and realigned to resolve existing problems and reduce maintenance costs.

Road Additions to the NFSR – See description on page II-12. The following existing roads were determined as necessary for the protection, administration, and utilization of the National Forest System and the use and development of its resources. These are presently “unauthorized” roads because they were not included in the Forest Transportation Atlas composed in 2005. These roads would be proposed as additions to the NFSR, and would become a permanent part of the transportation system. Twenty roads (#14004, 14076, 14082, 14274A, 14924, 14926, 14927 from MP 0.47 to 0.58, 14994, 15624A, 474P, 474R, 474S, 7175A, 7220A from MP 1.36 to 1.85, 7220E, 7222K, 7225, 7225A, 7972B, and 7972C), totaling 8.85 miles, would be added to the NFSR as official roads.

Recreation Facilities and Special Uses

These activities respond to ***Purpose and Need statements E and F*** and relate to ***Strategies 8 and 9***. Alternative 1 proposes the following projects. These potential projects are being analyzed now, but may be accomplished as funding allows.

Construction of a boat ramp, parking area, and restroom – See description on page II-12.

Robinson Mountain Trail – See description on page II-12.

Robinson Mountain Lookout – See description on page II-12.

Special Use Permits – See description on page II-12.

Table 2-2 Alternative 1 Unit Information

Unit #	Acres	Management Area(s)	Silvicultural Prescription	Yarding Method	Fuel Treatment
1	379	10	Prescribed Burn with Mechanical Pre-Treatment	Ground skid	UB
103	85	12	Prescribed Burn with Mechanical Pre-Treatment	Ground skid	UB
2	147	11	Commercial Thin	Ground skid	UB/EP
201	15	11	Seed Tree	Ground skid	UB

Unit #	Acres	Management Area(s)	Silvicultural Prescription	Yarding Method	Fuel Treatment
3	154	12, 13	Prescribed Burn with Mechanical Pre-Treatment	Ground skid	UB
4	556	10	Prescribed Burn Only (Maintenance Burn)		UB
5	65	12	Prescribed Burn with Mechanical Pre-Treatment	Ground skid	UB
6	114	12	Commercial Thin	Ground skid	UB
7	36	11	Prescribed Burn Only (Maintenance Burn)		UB
8	163	11	Prescribed Burn Only (Maintenance Burn)		UB
9	480	11	Prescribed Burn Only (Maintenance Burn)		UB
10	701	11, 13	Prescribed Burn with Mechanical Pre-Treatment	Ground skid	UB
111	163	11	Prescribed Burn with Mechanical Pre-Treatment	Ground skid	UB
211	40	11	Seed tree with Reserves	Ground skid	EP and/or UB
12	30	11	Seed tree with Reserves	Ground skid	EP and/or UB
112	48	11	Seed tree with Reserves	Ground skid	UB
212	31	11	Seed tree with Reserves	Ground skid	UB
13	50	13	Prescribed Burn with Mechanical Pre-Treatment		UB
14	24	13	Prescribed Burn with Mechanical Pre-Treatment		UB
16	42	12	Commercial Thin	Ground skid	EP and/or UB
116	15	12	Commercial Thin	Skyline	SP/UB
216	167	11, 12, 13	Prescribed Burn Only (Ecosystem Burn)		UB
17	300	12	Seed tree with Reserves	Ground skid	UB
118	89	12	Prescribed Burn with Mechanical Pre-Treatment	Ground skid	UB
19	114	11, 12, 15	Seed tree with Reserves	Adverse forwarder	UB
120	170	11	Prescribed Burn with Mechanical Pre-Treatment	Ground skid	UB
220	119	11	Commercial Thin	Ground skid	UB
21	276	11, 16	Seed tree with Reserves	Ground skid	UB
23	119	12, 16	Seed tree with Reserves	Ground skid	UB
24	96	16	Commercial Thin	Ground skid	UB
25	234	12, 16	Seed tree with Reserves	Ground skid	UB
125	227	12, 16	Prescribed Burn Only (Ecosystem Burn)		UB

Unit #	Acres	Management Area(s)	Silvicultural Prescription	Yarding Method	Fuel Treatment
29	72	15	Seed tree with Reserves	Skyline	UB
129	35	15	Seed tree with Reserves	Skyline	UB
30	269	12, 15	Seed tree with Reserves	Ground skid	UB
38	112	12	Seed tree with Reserves	Skyline/Ground skid	UB
138	34	12	Clearcut with Reserves	Ground skid	UB
40	120	12	Seed tree with Reserves	Ground skid	UB
46	377	2, 2og	Prescribed Burn Only (Ecosystem Burn)		UB
47	132	11	Commercial Thin	Ground skid	UB
48	39	12	Prescribed Burn Only (Ecosystem Burn)		UB
49	58	12	Post and Pole	Ground skid	LS/EP
50	156	12	Roadside Salvage	Ground skid	LS/EP
51	178	15	Roadside Salvage	Ground skid	LS/EP
52	78	11	Prescribed Burn with Mechanical Pre-Treatment	Ground skid	UB
53	23	12	Seed tree with Reserves	Ground skid	UB

Explanation of Abbreviations:

EP Excavator Pile
UB Underburn
SP Spot Pile
LS Lop and Scatter

Alternative 1M

Alternative 1M was developed in response to discussions with the Kootenai Forest Stakeholder Coalition. Alternative 1M's objectives are the same as that of Alternative 1, but the specifications differ from Alternative 1 as follows:

- All of Unit 17 and 152 acres of Unit 21 (now Unit 223) were changed from a seed tree prescription to an irregular selection (free selection);
- All of Unit 38 and 102 acres of Unit 25 (now Units 221 and 222) were changed from a seed tree prescription to a shelterwood prescription;
- All of Units 12 and 29 were changed from a seed tree prescription to a seed tree/shelterwood/intermediate harvest mosaic;
- 26 acres of Unit 19 (now Unit 19a) were changed from a seed tree harvest to a commercial thinning;
- Unit 129 was dropped; and
- Unit 15 was dropped as a harvest unit and is now a precommercial thinning unit considered in the Rexford Ranger District's 2009-2010 precommercial thinning program (see Reasonably Foreseeable Actions in Chapter 1)
- After additional on-the-ground examinations, minor boundary and acreage changes occurred on a number of units to better conform to natural patterns on the landscape.

The project-specific Forest Plan amendments described in Alternative 1 would be required to implement this alternative. Regional Forester approval to exceed 40-acre openings would also be required.

Table 2-3. Features of Alternative 1M

Vegetation Management:	**6478 acres**
Shelterwood with Reserves	199 acres
Seed Tree with Reserves	727 acres
Clear Cut with Reserves	34 acres
Commercial Thin	630 acres
Mosaic Harvest	135 acres
Free Selection	390 acres
Prescribed Burn with Mechanical Pre-treatment	1946 acres
Roadside Salvage	324 acres*
Post and Pole Harvest	53 acres
Prescribed Burn Only - Maintenance	1236 acres
Prescribed Burn Only - Ecosystem	804 acres
Salvage of incidental mortality associated with prescribed burning	200 acres**
Harvest Volume	**18,112 CCF (9056 MBF)**
Fuel Treatment:	**6478 acres**
Underburn following timber harvest	2115 acres
Prescribed Burn with Mechanical Pre-treatment	1946 acres
Lop and Scatter/Excavator Pile	377 acres
Prescribed Fire Only – Maintenance	1236 acres
Prescribed Fire Only - Ecosystem	804 acres
Road Management:	
Road Maintenance (BMPs)	98 miles ***
Roads to be decommissioned	12 miles
Road to be placed in intermittent stored service	27 miles
Reconstruction (realignment) of existing roads	0.40 miles
Unauthorized roads proposed as additions to the NFSR	9 miles
Other Activities	
Miles of trail re-routing	1.5 miles
Number of special use permits analyzed	22 permits
Construction of a boat ramp and associated facilities	Yes

* Not all 324 acres would be harvested due to suitability of some areas

** Up to 200 acres may be harvested depending upon whether mortality occurs

*** Not all 98 miles would be treated; only portions of the roads requiring work would be treated, 17 additional miles of BMP work could be completed outside the Decision Area

FEATURES OF ALTERNATIVE 1M

Detailed information on the proposed units is contained in Table 2-4, pages II-22 and 23. A map of Alternative 1M is shown on MAP 2-2. The shapes of the proposed harvest units are for representation purposes, and show the treatment areas relative to other features on the landscape. Actual unit boundaries may be modified to conform to natural patterns on the landscape.

Vegetation Management

Each type of treatment proposed in Alternative 1M is designed to address one or more of the Purpose and Need for Action statements. These stand treatments are the specific tools utilized under *Strategies 1, 2, and 3*, as described in Chapter I.

Regeneration Harvest – The objectives for regeneration harvest are the same as described for Alternative 1. Reforestation would also occur as described for Alternative 1. Refer to pages II-5 and 6 for descriptions of regeneration harvest prescriptions.

Shelterwood with reserves (variable density, dispersed moderate retention[3]) – A shelterwood with reserves prescription would be implemented on 3 units totaling 199 acres.

Seed Tree with Reserves (variable density, dispersed light retention[1]) – A seedtree with reserves prescription would be implemented on eleven units totaling 850.

Intermediate Harvest – Intermediate harvest methods and objectives are the same as described for Alternative 1. Refer to pages II-7 and 8 for descriptions of intermediate harvest prescriptions.

Commercial Thin (variable density, moderate dispersed retention[1]) – See description on page II-7.

A commercial thinning would be implemented on eight units totaling 630 acres.

Roadside Salvage – (same as Alternative 1).

Post and Pole Harvest – (same as Alternative 1).

Salvage of Incidental Mortality from Underburning – (same as Alternative 1).

Regeneration/Intermediate Mosaic – Regeneration/intermediate combinations proposed by Alternative 1M would fall into one of the following categories:

<u>Seed tree/Shelterwood/Commercial Thin mosaics</u> (variable density, light to moderate dispersed retention[1]) – See description on pages II-8 and 9. In Units 29 and 201 seed trees would be selected by species and/or diameter. Leave trees would be variably dispersed to mirror the existing distribution. In Unit 12, the overstory varies in vigor and is infected with dwarf mistletoe. In this unit the most vigorous and lightly infected trees would be marked for retention.

Three units totaling 135 are proposed for a mosaic harvest.

<u>Irregular selection "Free-Selection"</u>(variable density, light to moderate retention, dispersed and aggregated[1]) – See description on page II-9.

Two units totaling 437 acres are proposed for free selection.

Fuel Treatment

Underburning with Harvest – See description on page II-9. Underburning with harvest would fit into 2 of the following categories:

Excavator Piling and Burning - See description on pages II-9 and 10. Portions of 19 units totaling 1131 acres would be excavator piled and burned.

Lop and Scatter/Excavator Pile – See description on page II-10. A lop and scatter/excavator pile treatment would be implemented on three units totaling 392 acres.

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[3] Retention terminology analogous to that found in Franklin et al 1997.

Underburning without Harvest - Two types of this treatment are described as Ecosystem Burn and Maintenance Burn.

Prescribed Burn with Mechanical Pre-treatment – See description on page II-10. This treatment would be implemented on eleven units totaling 1946 acres.

Prescribed Burn Only (Maintenance) – See description on page II-10. Maintenance burning would be implemented on four units totaling 1236 acres.

Prescribed Burn Only (Ecosystem Burn) – See description on pages II-10 and 11. Ecosystem burning would be implemented on four units totaling 804 acres.

Road Management

Alternative 1M proposes five types of road management activities: road maintenance, road decommissioning, intermittent stored service, road reconstruction, and NFSR additions. These activities respond to ***Purpose and Need statement D*** and relate to ***Strategies 4, 5, 6, and 7.***

Road Maintenance – See description on page II-11. Road maintenance would be conducted on 98 miles of road. This is less than Alternative 1 due to the difference in harvest units between the alternatives.

A map displaying the roads identified for BMP maintenance is shown in Chapter III. Alternative 1M differs from Alternative 1 because Unit 129 and a portion of Unit 25 were dropped and 2.7 miles of BMP would not be done under Alternative 1M. Tables listing the roads, mileage, and funding source for management activities are located in the Transportation section of the Project File.

Road Decommissioning – See description on page II-11. Approximately 12.25 miles of road would be decommissioned, as described in Alternative 1 (road numbers are identical for both Alternatives 1 and 1M).

Intermittent Stored Service – See description on pages II-11 and 12. Approximately 27.02 miles of a road would be placed into intermittent stored service, as described in Alternative 1 (road numbers are identical for both Alternatives 1 and 1M).

Road Reconstruction – See description on page II-12. Approximately 0.40 miles of road would be reconstructed (road numbers are identical for both Alternatives 1 and 1M), as described in Alternative 1.

Road Additions to the NFSR – See description on page II-12. Approximately 8.85 miles of road would be added to the NFSR (road numbers are identical for both Alternatives 1 and 1M), as described in Alternative 1.

Recreation Facilities and Special Uses

These activities respond to ***Purpose and Need statements E and F*** and relate to ***Strategies 8 and 9***. Alternative 1M proposes the following projects. These potential projects are being analyzed now, but may be accomplished as funding allows.

Construction of a boat ramp, parking area, and restroom – See page II-12 for description. Same as described for Alternative 1**.**

Robinson Mountain Trail - See page II-12 for description. Same as described for Alternative 1.

Robinson Mountain Lookout – See page II-12 for description. Same as described for Alternative 1**.**

Special Use Permits – See page II-12 for description. Same as described for Alternative 1**.**

Table 2- 4 Alternative 1M Unit Information

Unit #	Acres	Management Area(s)	Silvicultural Prescription	Yarding Method	Fuel Treatment
1	379	10	Prescribed Burn with Mechanical Pre-Treatment	Ground skid	UB
103	85	12	Prescribed Burn with Mechanical Pre-Treatment	Ground skid	UB
2	142	11	Commercial Thin	Ground skid	UB/EP
201	15	11	Mosaic Harvest	Ground skid	UB
3	151	12, 13	Prescribed Burn with Mechanical Pre-Treatment	Ground skid	UB
4	556	10	Prescribed Burn Only (Maintenance Burn)		UB
5	62	12	Prescribed Burn with Mechanical Pre-Treatment	Ground skid	UB
6	72	12	Commercial Thin	Ground skid	UB
7	36	11	Prescribed Burn Only (Maintenance Burn)		UB
8	163	11	Prescribed Burn Only (Maintenance Burn)		UB
9	480	11	Prescribed Burn Only (Maintenance Burn)		UB
10	701	11, 13	Prescribed Burn with Mechanical Pre-Treatment	Ground skid	UB
111	163	11	Prescribed Burn with Mechanical Pre-Treatment	Ground skid	UB
211	32	11	Seed tree with Reserves	Ground skid	EP and/or UB
12	29	11	Mosaic Harvest	Ground skid	EP and/or UB
112	37	11	Seed tree with Reserves	Ground skid	UB
212	28	11	Seed tree with Reserves	Ground skid	UB
13	49	13	Prescribed Burn with Mechanical Pre-Treatment		UB
14	24	13	Prescribed Burn with Mechanical Pre-Treatment		UB
16	40	12	Commercial Thin	Ground skid	EP and/or UB
116	13	12	Commercial Thin	Skyline	SP/UB
216	167	11, 12, 13	Prescribed Burn Only (Ecosystem Burn)		UB
17	237	12	Free Selection	Ground skid	UB
118	84	12	Prescribed Burn with Mechanical Pre-Treatment	Ground skid	UB
19	78	12, 15	Seed tree with Reserves	Adverse forwarder	UB

Unit #	Acres	Management Area(s)	Silvicultural Prescription	Yarding Method	Fuel Treatment
19A	26	12	Commercial Thin	Adverse forwarder	UB
120	170	11	Prescribed Burn with Mechanical Pre-Treatment		UB
220	110	11	Commercial Thin	Ground skid	UB
221	42	12	Shelterwood/Seed tree with Reserves	Ground skid	UB
222	60	16	Shelterwood/Seed tree with Reserves	Ground skid	UB
223	152	11, 16	Free Selection	Ground skid	UB
21	65	11	Seed tree with Reserves	Ground skid	UB
23	97	12, 16	Seed tree with Reserves	Ground skid	UB
24	96	16	Commercial Thin	Ground skid	UB
25	96	12, 16	Seed tree with Reserves	Ground skid	UB
125	222	12, 16	Prescribed Burn Only (Ecosystem Burn)		UB
29	91	15	Mosaic Harvest	Skyline	UB
30	224	12, 15	Seed tree with Reserves	Ground skid	UB
38	97	12	Shelterwood/Seed tree with Reserves	Skyline/Ground skid	UB
138	34	12	Clearcut with Reserves	Ground skid	UB
40	49	12	Seed tree with Reserves	Ground skid	UB
46	376	2, 2og	Prescribed Burn Only (Ecosystem Burn)		UB
47	132	11	Commercial Thin	Ground skid	UB
48	39	12	Prescribed Burn Only (Ecosystem Burn)		UB
49	53	12	Post and Pole	Ground skid	LS/EP
50	154	12	Roadside Salvage	Ground skid	LS/EP
51	170	15	Roadside Salvage	Ground skid	LS/EP
52	78	11	Prescribed Burn with Mechanical Pre-Treatment	Ground skid	UB
53	22	12	Seed tree with Reserves	Ground skid	UB

Explanation of Abbreviations:

EP Excavator Pile
UB Underburn
SP Spot Pile
LS Lop and Scatter

Alternative 2 – No Action

Alternative 2 displays the course of change in the Project Area that would be expected if no proposed management activities were to occur. It serves as a baseline for comparing the effects of implementing management actions contained in the action alternatives. The course of change on the landscape may include the potential for naturally-occurring events such as blowdown, wildfire, or insect and disease infestation. The No Action alternative is required by the National Environmental Policy Act (40 CFR 1502.14).

Under this alternative, management actions in the Project Area would be limited to the current and reasonably foreseeable actions listed in Chapter I, Table 1-2, pages I-14 to 15. These include vegetation management and fuel reduction, cattle grazing, noxious weed treatment, wildfire suppression, road management, recreation maintenance, special uses, public use on NFS land, private land activities, and activities from other agencies.

This alternative represents the existing condition. Since there are no further planned activities associated with this alternative, MAP 1-2, containing the Past Actions, represents Alternative 2.

Alternative 3

Alternative 3 was developed to respond to the project's Purpose and Need for Action while meeting all Forest Plan standards. It addresses the Significant Issues of harvesting in big game movement corridors between existing openings in MA 12, harvesting new units in MA 12 that are adjacent to existing units that are not providing suitable hiding cover, creating harvest large openings (greater than 40 acres) in MA 12, and exceeding the MA 12 open road density standard. The alternative responds to these issues by dropping units, modifying unit boundaries, or closing currently open roads to avoid exceeding the MA 12 open road density standard. Fuels treatments included in old growth habitat, designated or undesignated, under Alternative 1 and 1M were not included in this alternative.

The project-specific Forest Plan amendments described in Alternative 1 and 1M would not be required to implement this alternative. However, Regional Forester approval to exceed 40-acre openings would be required.

Table 2- 5. Features of Alternative 3

Vegetation Management:	5608 acres
Shelterwood with Reserves	0 acres
Seed Tree with Reserves	1618 acres
Clear Cut with Reserves	0 acres
Commercial Thin	802 acres
Mosaic Harvest	0 acres
Free Selection	0 acres
Prescribed Burn with Mechanical Pre-treatment	1077 acres
Roadside Salvage	334 acres*
Post and Pole Harvest	58 acres
Prescribed Burn Only - Maintenance	1236 acres
Prescribed Burn Only - Ecosystem	483 acres
Salvage of incidental mortality associated with prescribed burning	200 acres**
Harvest Volume	**18,112 CCF (9056 MBF)**
Fuel Treatment:	**5608 acres**
Underburn following timber harvest	2420 acres
Prescribed Burn with Mechanical Pre-treatment	1077 acres
Lop and Scatter/Excavator Pile	392 acres
Prescribed Fire Only – Maintenance	1236 acres
Prescribed Fire Only - Ecosystem	483 acres
Road Management:	
Road Maintenance (BMPs)	97 miles ***
Roads to be decommissioned	12 miles
Road to be placed in intermittent stored service	27 miles
Reconstruction (realignment) of existing roads	0.40 miles
Unauthorized roads proposed as additions to the NFSR	9 miles
Other Activities	
Miles of trail re-routing	1.5 miles
Number of special use permits analyzed	22 permits
Construction of a boat ramp and associated facilities	Yes

* Not all 324 acres would be harvested due to suitability of some areas

** Up to 200 acres may be harvested depending upon whether mortality occurs

*** Not all 97 miles would be treated; only portions of the roads requiring work would be treated, 17 additional miles of BMP work could be completed outside the Decision Area

FEATURES OF ALTERNATIVE 3

Detailed information on the proposed units is contained in Table 2-6, pages II-26 and 27. A map of Alternative 3 is shown on MAP 2-3. The shapes of the proposed harvest units are for representation purposes, and show the treatment areas relative to other features on the landscape. Actual unit boundaries may be modified to conform to natural patterns on the landscape.

Vegetation Management

Regeneration Harvest - The objectives for regeneration harvest are the same as described for Alternative 1. Reforestation would also occur as described for Alternative 1. Refer to pages II-5 and 6 for descriptions of regeneration harvest prescriptions.

Seed Tree – Implement nineteen units totaling 1618 acres.

Intermediate Harvest – Intermediate harvest methods and objectives are the same as described for Alternative 1. Refer to pages II-7 and 8 for descriptions of intermediate harvest prescriptions.

Commercial Thin – Implement nine units totaling 802 acres.

Roadside Salvage – Implement two units totaling 334 acres.

Post and Pole Harvest – Implement one unit totaling 58 acres.

Salvage of Incidental Mortality from Underburning – The same opportunities identified for Alternative 1 are applicable to this alternative.

Fuel Treatment

Underburning with harvest – The methods and objectives are the same as for **Alternative 1**. Refer to pages II-9 and 10 for descriptions of fuel treatments.

Prescribed Burn with Mechanical Pre-treatment – Implement ten units totaling 1077 acres.

Excavator Piling and Burning – Implement portions of nineteen units totaling 740 acres.

Lop and Scatter / Excavator Pile – Implement three units totaling 392 acres.

Underburn without Harvest - The objectives are the same as for Alternative 1. Refer to pages II-10 and 11 for descriptions of fuel treatments.

Prescribed Burn Only (Maintenance) – Implement four units totaling 1236 acres.

Prescribed Burn Only (Ecosystem Burn) – Implement two units totaling 483 acres.

Road Management

Road Maintenance – See page II-11 for description. Portions of approximately 97 miles of existing road surface would be maintained within the Project Area as described for Alternative 1.

A map displaying the roads identified for BMP maintenance is shown in MAP 2-3. Tables listing the roads, the mileage, and the funding source for treatment are located in the Transportation section of the Project File.

Road Decommissioning – See page II-11 for description. Approximately 12.25 miles of road would be decommissioned, as described in Alternative 1 (road numbers are identical for both Alternatives 1 and **3**).

Intermittent Stored Service – See pages II-11 and 12 for description. Approximately 27.02 miles of a road would be placed into intermittent stored service, as described in Alternative 1 (road numbers are identical for both Alternatives 1 and 3).

Road Reconstruction – See page II-12 for description. Approximately 0.40 miles of road would be reconstructed (road numbers are identical for both Alternatives 1 and 3), as described in Alternative 1.

Road Additions to the NFSR – See page II-12 for description. Approximately 8.85 miles of road would be added to the NFSR (road numbers are identical for both Alternatives 1 and 3), as described in Alternative 1.

Recreation Facilities and Special Uses

Construction of a boat ramp, parking area, and restroom – See page II-12 for description. Same as described for Alternative 1.

Robinson Mountain Trail - See page II-12 for description. Same as described for Alternative 1.

Robinson Mountain Lookout – See page II-12 for description. Same as described for Alternative 1.

Special Use Permits – See page II-12 for description. Same as described for Alternative 1.

Table 2- 6. Alternative 3 Unit Information

Unit #	Acres	Management Area(s)	Silvicultural Prescription	Yarding Method	Fuel Treatment
1	379	10	Prescribed Burn with Mechanical Pre-Treatment	Ground skid	UB
103	31	12	Prescribed Burn with Mechanical Pre-Treatment	Ground skid	UB
203	28	12	Prescribed Burn with Mechanical Pre-Treatment	Ground skid	UB
2	163	11	Commercial Thin	Ground skid	UB/EP
3	28	12	Prescribed Burn with Mechanical Pre-Treatment	Ground skid	UB
4	556	10	Prescribed Burn Only (Maintenance Burn)		UB
6	113	12	Commercial Thin	Ground skid	UB
7	36	11	Prescribed Burn Only (Maintenance Burn)		UB
8	163	11	Prescribed Burn Only (Maintenance Burn)		UB
9	480	11	Prescribed Burn Only (Maintenance Burn)		UB
10	58	11	Prescribed Burn with Mechanical Pre-Treatment	Ground skid	UB
110	154	11	Prescribed Burn with Mechanical Pre-Treatment	Ground skid	UB
111	62	11	Prescribed Burn with Mechanical Pre-Treatment	Ground skid	UB
211	40	11	Seed tree	Ground skid	SP/UB
12	30	11	Seed tree	Ground skid	EP and/or UB
112	48	11	Seed tree	Ground skid	UB
212	31	11	Seed tree	Ground skid	UB
16	42	12	Commercial Thin	Ground skid	EP and/or UB
116	15	12	Commercial Thin	Skyline	SP/UB
17	300	12	Seed tree	Ground skid	UB
118	89	12	Prescribed Burn with Mechanical Pre-Treatment	Ground skid	UB

Unit #	Acres	Management Area(s)	Silvicultural Prescription	Yarding Method	Fuel Treatment
19	35	12, 15	Seed tree	Skyline/Adverse forwarder	UB
120	170	11	Prescribed Burn with Mechanical Pre-Treatment	Ground skid	UB
220	119	11	Commercial Thin	Ground skid	UB
21	276	11, 16	Seed tree	Ground skid	UB
23	95	12, 16	Seed tree	Ground skid	UB
24	96	16	Commercial Thin	Ground skid	UB
25	56	12, 16	Seed tree	Ground skid	UB
125	227	12, 16	Prescribed Burn Only (Ecosystem Burn)		UB
225	42	12	Seed tree	Ground skid	UB
325	70	16	Seed tree	Ground skid	UB
26	70	12	Commercial Thin	Ground skid	UB
28	27	12	Seed tree	Ground skid	UB
29	72	15	Seed tree	Skyline	UB
129	35	15	Seed tree	Skyline	UB
30	176	12, 15	Seed tree	Ground skid	UB
38	112	12	Seed tree	Skyline/Ground skid	UB
40	101	12	Seed tree	Ground skid	UB
46	256	2	Prescribed Burn Only (Ecosystem Burn)		UB
47	132	11	Commercial Thin	Ground skid	UB
49	58	12	Post and Pole	Ground skid	LS/EP
50	156	12	Roadside Salvage	Ground skid	LS/EP
51	178	15	Roadside Salvage	Ground skid	LS/EP
52	78	11	Prescribed Burn with Mechanical Pre-Treatment	Ground skid	UB
53	23	12	Seed tree	Ground skid	UB
54	53	12	Commercial Thin	Ground skid	UB

Explanation of Abbreviations:

EP Excavator Pile
SP Spot Pile
LS Lop and Scatter
UB Underburn

COMPARISON OF ALTERNATIVES

The following table compares each alternative's features as described in this chapter. Numbers are rounded to the nearest whole number; refer to alternative unit summary tables for more precise figures.

Table 2- 7 Comparison of Alternative Features

Features	Alternative 1	Alternative 1M	Alternative 2	Alternative 3
Harvest :				
Seed tree with Reserves	1822 acres	727 acres	0 acres	1618 acres
Clear Cut with Reserves	34 acres	34 acres	0 acres	0 acres
Shelterwood with Reserves	0 acres	199 acres	0 acres	0 acres
Regeneration/Intermediate Mosaic	15 acres	135 acres	0 acres	0 acres
Free Selection	0 acres	390 acres	0 acres	0 acres
Commercial Thin	664 acres	630 acres	0 acres	802 acres
Roadside Salvage	334 acres	324 acres	0 acres	334 acres
Post and Pole	58 acres	53 acres	0 acres	58 acres
Salvage of mortality incidental to prescribed burning	200 acres	200 acres	0 acres	200 acres
TOTAL ACRES HARVESTED	**2927**	**2492**	**0**	**2812**
Fuel treatment following harvest:				
Underburning	2927 acres	2492 acres	0 acres	2812 acres
Fuel treatment without harvest:				
Underburning	4005 acres	3986 acres	0 acres	2796 acres
TOTAL ACRES TREATED	**6932**	**6478**	**0**	**5608**
Harvest Volume:				
CCF	19,502	15,994	0	18,112
MBF	9751	7997	0	9056
Road Management:				
Road maintenance (BMPs)*	100.2 miles**	97.53 miles**	0 miles	97.48 miles**
Roads to be decommissioned	12.25 miles	12.25 miles	0 miles	12.25 miles
Road to be placed in intermittent stored service	27.02 miles	27.02 miles	0 miles	27.02 miles
Reconstruction of existing roads	0.40 miles	0.40 miles	0 miles	0.40 miles
Roads to be added to the NFSR	8.85 miles	8.85 miles	0 miles	8.85 miles
OTHER FEATURES				
Forest Plan amendments	Yes	Yes	No	No
Openings greater than 40 acres	Yes	Yes	No	Yes
Management in old growth	Yes	Yes	No	No
Transportation system BMPs	Yes	Yes	Routine	Yes
Improvements to recreation facilities including construction of a boat ramp and facilities, trail reroutes, and improvements to the Mt. Robinson lookout.	Yes	Yes	No	Yes
Analyze special use permits	Yes	Yes	No	Yes

*****Accomplished as needed with timber sale contracts

******Not all miles would be treated; only those portions of roads requiring work would be treated, 17 additional miles of BMP work could be completed outside the Decision Area

COMPARISON BY ALTERNATIVE

The following table compares each alternative's response to the Significant Issues identified during the scoping process, and described at the beginning of this chapter.

Table 2- 8 Comparison of Significant Issues by Alternative

Significant Issues	Alternative 1	Alternative 1M	Alternative 2	Alternative 3
Effects of harvesting in big game movement corridors in MA 12 and the effects of creating large openings in MA 12 Measurement Indicators: 1) changes in the number of openings greater than 40 acres in MA 12 and all other non-winter MAs (15, 16) 2) % increase in forage (cover/forage ratio) in MA 12 and other non-winter range MAs 3) number of movement areas removed between non-recovered units (units that do not provide hiding cover).	1) 10 2) 8% 3) 4	1) 8 2) 6% 3) 2	1) 0 2) 0% 3) 0	1) 11 2) 7% 3) 0
Effects of harvesting new units in MA 12 adjacent to existing units that are not providing hiding cover Measurement Indicator: Number of movement areas removed between non-recovered units (units that do not provide hiding cover).	4	2	0	0
Effects of Exceeding the MA 12 Open Road Density Standard Measurement Indicators: 1) ORD levels during project implementation 2) ORD levels following project completion 3) Habitat effectiveness during / following project implementation	1) 0.81 2) 0.81 3) 65% / 65%	1) 0.81 2) 0.81 3) 65% / 65%	1) 0.81 2) 0.81 3) 65% / 65%	1) 0.75 2) 0.75 3) 68% / 68%

MANAGEMENT REQUIREMENTS AND DESIGN CRITERIA

The measures identified in the following table serve to further reduce impacts to the specific resources identified. Most are considered design criteria and are included in all action alternatives.

Several abbreviations are used in the responsibility section of **Table 2-9**. The following explains those abbreviations:

DR	District Ranger	BT	Botanist
SA	Sale Administrator	TMC	Timber Marking Crew
SP	Sale Preparation	NWM	Noxious Weed Manager
WB	Wildlife Biologist	LEO	Law Enforcement Officer
FMO	Fire Management Officer	IDT	Interdisciplinary Team members
ENG	Engineer	ARCH	Archaeologist
SILV	Silviculturist	HYD	Hydrologist
DRC	District Road Coordinator	TP	Timber Sale Purchaser
RF	Resource Forester	RA	Range Administrator

Table 2- 9 Management Requirements and Design Criteria

Objective	Task	Responsibility	Due Date	Action Alts Affected
Minimize disturbance to raptors	If raptor-nesting territories are observed, avoid disturbance when possible, during the nesting/fledgling period (5/15-8/15). Include in sale contract if sites are known prior to selling. Consult with Wildlife Biologist on buffers and disturbance period dates.	SA, WB, SP, FMO	Pre-sale and harvest	All

Objective	Task	Responsibility	Due Date	Action Alts Affected
Maintain cavity-nesting habitat	Where snag numbers are insufficient to meet snag levels by VRU (identified in the Snag Section at the 100% level) existing DF, WL, and PP snags greater than 10" dbh and 10 feet in height will be marked and protected during timber harvest and site preparation as long as safety requirements are met. Merchantable trees (live or dead) will be reserved (Provisions CT2.3# and CT6.32#) if snag levels are still not met. If felled for safety, they will be left on site. Maintain the largest snags first. Favor trees further than one tree length from the road prism or any external boundary.	WB, SP, TMC, SA, FMO	Pre-sale and harvest	All
Provide for future cavity-nesting habitat, down woody habitat recruitment, and structural diversity.	Rexford Ranger District snag management protocol will be utilized to provide adequate snags for wildlife habitat. Units in MA 15 will be managed at the 40% level as prescribed in the Forest Plan. All other MAs will be managed at the 100% cavity habitat effectiveness level.	WB, TMC, SP	Pre-sale	All
Leave tree protection	Evenly distribute slash to protect leave trees.	SA, SILV, FMO	Pre-sale	All
Maintain winter range integrity.	Restrict mechanized activities associated with logging and slashing off Roads 852, 852A, 852B, 7186, 7186A, and 7186B to be consistent with the Road Closure Code 03 (Restricted to motorized vehicles Dec. 1 – April 30).	WB, SA, SP, FMO	Pre-sale, harvest, and site prep	All
Provide for wildlife security	Determine the time of road restrictions involved with timber sales in the pre-sale roundtable discussion. Implement new road restrictions after timber harvest where applicable and maintain existing restrictions to the public during all operations.	SA, WB, TP, SP, ENG	Pre-sale & Post-sale	All
Lynx habitat management	Defer the harvest of the northern portion of Unit 17 between the 303H and 303 roads until the adjacent harvest opening is providing hiding cover.	SA, WB	Pre-sale	Alt 3

Objective	Task	Responsibility	Due Date	Action Alts Affected
Meet standards and guides of the NRLA for management in Lynx habitat	Defer burning of Unit 46 after 2011.	FMO, WB	Prior to activity	All
Provide wildlife security and protection in MA 12	Move gates back appropriate distances to meet MA 12 facility standard #3 on roads 7168 and 303.	WB, ENG, SA	During harvest	Alt 3
Minimize impacts (i.e. human disturbances) to fisher during the breeding, denning, and rearing season	Restrict timber harvest activities in fisher habitat from February 15 thru June 30. Applies to Units 17, 38, 40, 36, 225, 25 (western portion), 129, 29 & 112 in Alternatives 1 and 3 and additionally to unit 138 for Alternative 1.	WB, SP, SA, TP	Contract prep, during harvest	All
Meet ESA requirements	If critical habitat is identified during implementation of the proposed activities, special protection measures will be implemented by including provision CT6.251 in all applicable timber sale contract packages. This provision is mandatory.	SP, SA, WB, TP	Contract prep and logging	All
Maintain old growth characteristics within old growth character stands (Green et al, 1992; USDA Forest Service, 1987a)	In the MA 13 portions of Units 3, 10, 13, 14, 110, and 111 no merchantable material will be removed. Outside MA 13 in these units, products (e.g. biomass) may be removed.	WB, SILV, SP	Harvest Prescription, Sale Prep	Alt. 1

Objective	Task	Responsibility	Due Date	Action Alts Affected
Preserve sensitive plant populations and their habitats	Protect sensitive plant populations, if found. Modifications to fuels management and/or timber sale, if necessary, will occur. Special Treatment Areas will be created or unit boundaries will be relocated to avoid negative impacts. Avoid disturbance of sensitive plant populations observed during sale activity through cooperation between sale administrators and loggers. Any sensitive plant species observed during sale activity will be given protective measures as afforded by standard contract clause CT6.251.	SA, SILV, FMO	Prior to Implementation	All
Preserve sensitive plant populations and their habitats	Bedrock meadows, rock outcrops and seepages included or adjacent to treatment areas will be reviewed on a site-by-site basis before any actions proceed on the ground.	SA, WB, BT, FMO	Prior to Implementation	All
Soil productivity	Maintain soil productivity through retention of CWD at levels recommended by Graham et al (1994) and Brown et al (2003). Only material greater than 3" would count toward the required tons per acre of CWD. Refer to Table 3-7 in the Soils section for the listing of tons/acre by unit.	SA, FMO, HYD	During Harvest, Post Harvest	All
Soil productivity	Where possible, allow for one to two winter seasons between harvest and underburning to maximize leaching of nutrients from logging slash into the soil.	SA, FMO, HYD	Post Harvest	All
Soil protection	Use an excavator for mechanized slash piling and fire line construction to minimize the amount of soil disturbance.	SA, FMO, HYD	During Harvest, Post Harvest	All
Soil protection	Operate equipment over slash mat where feasible.	SP, SA, HYD	During Harvest, Post Harvest	All
Soil protection	Ground-based operations would occur during dry, frozen, or snow-covered conditions. Snow-covered conditions consist of two or more feet of snow or frozen ground at any soil moisture level except over wetlands.	HYD, SP, SA	Pre Harvest, During Harvest	All

Objective	Task	Responsibility	Due Date	Action Alts Affected
Soil protection	Utilize existing skid trails and landings in all units where they exist and where feasible; specifically in Units 2, 12, 15, 19, 21, 47, 54, 112, 211, 212, and 220.	SP, SA, HYD	Pre Harvest, During Harvest	All
Soil protection	Where previously excavated trails are used for the timber sale, re-contour upon completion of the unit.	SA, HYD	Pre Harvest, During Harvest	All
Soil protection	Skid trails within units 2, 12, 15, 21, 112, 211, 212, and 220 will be ripped and/or recontoured and covered with slash and Coarse Woody Debris.	SA, HYD	Post Harvest	All
RHCA protection	Riparian Habitat Conservation Areas (RHCAs) will be established for streams, lakes, and wetlands using the KNF Riparian Guidelines as modified by INFS (USDA Forest Service 1995b). The MT State SMZ Law and Rules are also incorporated in these guidelines. Please refer to one of the four RHCA modification documents in the Project File for specific modifications to each unit. The four documents cover prescribed burning only, prescribed burning with manipulation, regeneration harvest, and intermediate harvest.	SP, SA, HYD	Sale Prep, Pre Harvest, During Harvest	All
Water quality	Soil and Water Conservation Practices, or Best Management Practices (BMPs), would be applied to all proposed harvest activities. A list of BMPs that would be applied for this project is contained in Appendix 2.	SA, ENG, HYD	Pre Harvest, During Harvest, and Post Harvest	All
Reduce erosion on system roads and protect road surfaces	Restrict traffic as necessary on roads during spring breakup to prevent rutting and accelerated erosion.	SA, ENG, HYD	Pre-harvest, during hauling, Post harvest	All
Control erosion and sedimentation	Scarify heavily disturbed landings, main skid trails, and temporary spur roads.	SP, SA, HYD	Pre-harvest, During harvest & Post-harvest	All

Objective	Task	Responsibility	Due Date	Action Alts Affected
Control erosion, reduce hydrologic effects of temporary roads	Decommission temporary roads using drain dips, out-sloping road, scarifying, seeding, and recontouring.	SA, SP, HYD	Post-harvest	All
Protect range improvements in place within the Project Area	Assure that range improvement structures are identified and protected during and after harvest activity.	SA, TMC, IF, FMO, SP	Pre and Post sale	All
Protection of special use structures	Assure that utility lines and roads under special use are protected during and after harvest activity.	SA, TMC, IF, FMO, SP, RF	Pre and Post sale	All
Management Requirements and Design Criteria Identify American Indian concerns relating to project activities	Consult with American Indian tribal representatives and traditionalists of the Confederated Salish and Kootenai Tribes (CSKT) and Kootenai Tribe of Idaho who may have concerns about federal actions that may affect religious practices, other traditional cultural uses, as well as cultural resource sites and remains associated with American Indian ancestors.	ARCH	Pre-Sale, Contract prep, during harvest, and site prep.	All
Protect known archaeological sites	Either hand pile and underburn Unit 52; or machine pile and monitor for disturbance prior to and during implementation.	ARCH, FMO	Pre-Sale, Contract Prep, during harvest and site prep	As Recommended
Preserve and protect historic properties	On-the-ground surveys will be conducted in proposed units prior to project implementation. These surveys will be documented and forwarded to the Montana State Historic Preservation Office for concurrence. All sites located that are eligible to the National Register of Historic Places will be avoided, protected, or mitigated.	ARCH, SP	Pre-Sale, Contract prep, and during harvest	All

Objective	Task	Responsibility	Due Date	Action Alts Affected
Meet Montana Air Quality Standards	Wherever National Forest burning activities will occur, the direction contained in the Forest Plan Standards and Guidelines will insure compliance with the Smoke Management Plan published by the Montana Air Quality Division and administered by the Montana State Airshed Group (see project file).	DR, FMO	Post-sale	All
Meet Montana Air Quality Standards	Maximize spring and early summer underburning due to favorable atmospheric conditions.	FMO	Post-sale	All
Meet Montana Air Quality Standards	Construct machine piles to minimize the incorporation of dirt into the piles. Allow piles to cure for a minimum of 30 days to minimize emissions from burning green material.	FMO/SA	Post-sale	All
Minimize erosion, encourage native plants, and prevent noxious weed infestations	On closed roads, skid trails, landings, fire lines, and decommissioned roads, use the required seed mixture listed in the timber sale contract. Use all state, blue tag, certified weed seed-free mixes when seeding fire lines and erosion control areas. (CT 6.612#)	NWM, SA	Post activity	All
Control the spread of noxious weeds	Monitor roads along haul route and within sale area prior to starting sale activity. Treat infested roads as necessary.	SP, NWM, SA	Prior to activity	All
Control the spread of noxious weeds	Clean off-road equipment of soil and loose debris (CT6.351#) prior to moving to Sale Area.	SA, NWM	Prior to activity	All
Control the spread of noxious weeds	When using gravel from borrow pits, adhere to MOU with Lincoln County.	ENG, NWM	Prior to activity	All
Control the spread of noxious weeds	Locate/design skid and decking and landing sites in areas not infested with noxious weeds (where possible). Spray known infested sites prior to ground-disturbing activity.	SA, NWM	Prior to activity	All
Access management	Utilize unauthorized roads 14047, 14922, 15606H, 7218Z, 7222A, 7222F, and 7222J as needed for harvest activities while adhering to operational BMPs. Decommissioning these roads after use will be part of the timber sale requirements.	SA	Post-harvest	All

Objective	Task	Responsibility	Due Date	Action Alts Affected
Access management	Roads 7173D, 7211B, 7218A, and 7222G will adhere to operational BMPs during harvest and then be decommissioned after use. The road decommissioning work will be a part of the timber sale requirements.	SA	Post-harvest	All
Access management	Roads 14076, 14081, 14926, 474P, 7168A, 7168B, 7168C, 7205P, 7222B, 7222C, 7222K, 7225, 7225A and a portion of road 303 are proposed for intermittent stored service. This work would be performed as part of a timber sale. The portion of Road 303 will add to grizzly bear core habitat.	WB, ENG, SA	After Project Implementation	All
Access management	A natural-appearing physical closure is to be installed in place of the gate on Road 999 to increase grizzly bear core habitat following burning activities. The road entrance will be recontoured where possible, or natural-material barrier will be installed to place the road in intermittent stored service.	SA, ENG, DRC	Pre-sale & Post-sale	All

CHAPTER III - AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

Chapter III describes the physical, biological, and social conditions in the Project Area, and the environmental consequences of implementing the alternatives presented in Chapter II. As directed by the Council on Environmental Quality's implementing regulations for the National Environmental Policy Act (NEPA), the discussion focuses on the Significant Issues presented in Chapter II and evaluates the effects of the project to forest resources. Only those descriptions necessary to understand the effects of the alternatives on resources are provided (40 CFR 1502.15); supporting data and analysis are located in the resource sections of the Project File.

The discussion of environmental consequences forms the basis for comparing the alternatives under consideration. Environmental consequences are discussed in terms of the **direct, indirect, reasonably foreseeable, and cumulative effects** (40 CFR 1502.16). **Direct effects** are caused by the proposed activities and occur at the same time and place (40 CFR 1508.8). **Indirect effects** are caused by proposed activities, and occur later in time or are further removed in distance, but are still **reasonably foreseeable** (40 CFR 1508.8). **Cumulative effects** result from incremental impacts of proposed activities when added to other past, present, and reasonably foreseeable actions regardless of what agency or person undertakes such other actions (40 CFR 1508.7). Some resource conditions consider a larger area if predicted effects extend beyond the Project Area. Information concerning the spatial and temporal bounds for each resource analysis is located in the respective sections of analysis and in the Project File.

The cumulative effects analysis builds on the existing condition assessment in the affected environment by considering the incremental addition of direct and indirect effects of proposed, as well as present and reasonably foreseeable actions. While impacts can be differentiated by direct, indirect, and cumulative, the concept of cumulative impacts takes into account the compounding effects of disturbances resulting from all actions. The following describes other actions (past, present, reasonably foreseeable) that have the potential to contribute to cumulative effects for the resources in the area. Each resource area considers the relevant past, present and reasonably foreseeable actions as they affect their resource.

PAST ACTIONS

The environmental analysis required under NEPA is forward-looking in that it focuses on the potential effects of the proposed action that the agency is considering. Thus, the review of past actions is required to the extent that this review informs agency decision-making regarding the proposed action (36CFR 220.4(f)).

Past actions are management activities (timber harvest, precommercial and commercial thinning, prescribed burning, road construction and maintenance) and events (wildfires) that have occurred in the Project Area. The effects of these activities and events were considered in the analysis of the existing conditions of the resources in the Project Area. A map of past actions is shown in MAP 1-2.

Additional information is contained in the Project Files for each of the resources.

The past activities and events for the Project Area are those that occurred during the past and were documented in the computer database. These are summarized in Table 3-1. For a list of past actions, refer to Appendix 5.

Table 3- 1 Past Actions

Activity	Description	Acres/Miles	% of the Project Area
Vegetation Management	Intermediate harvest (sanitation/salvage and improvement)	11,278	29.8
	Precommercial thinning	5881	15.5
	Regeneration harvest (clearcut, seed tree, and shelterwood)	11,946	31.5
	Private land regeneration harvest	641	1.6
	Private land intermediate harvest	2611	6.9
	State land intermediate harvest	315	0.8
Prescribed Burning	Natural fuels treatments (ecosystem burning, non-timber harvest fuel treatments)	4490	11.8
Wildfire	Young J (2000)	825	11.7
	All other fires	340	0.9
Road Construction	Miles of all roads in the Project Area	273.67	N/A
Cattle Grazing	225 cow/calf pairs. This allotment extends beyond the Project Area.	27,200	71.8

CURRENT AND REASONABLY FORESEEABLE ACTIONS

Current and reasonably foreseeable actions are those management activities planned by the Forest Service, State of Montana, and the public that the members of the ID Team determined were appropriate to consider in the cumulative effects analyses for their resources. Current and reasonably foreseeable actions would occur regardless of which alternative is selected for implementation.

Current actions are activities or projects that are ongoing. Reasonably foreseeable actions are defined as Federal or non-Federal activities not yet undertaken, for which there are existing decisions, funding, or identified proposals. Identified proposals for the Forest Service actions are described in 220.4(a) (36 CFR 220.3).

Current and reasonably foreseeable actions that could be mapped are shown in MAP 1-3.

Table 3- 2 Current and Reasonably Foreseeable Actions

(C = Current Actions; F= Reasonably Foreseeable Actions)

Activity	Description	C	F
Vegetation Management and Fuels Reduction Activities	Approximately 2000 acres of precommercial thinning below 4000 feet is scheduled between 2012 and 2019.		X
	2011 Commercial Thinning Project- Dodge Mountain Pine Beetle Unit– 109 acres total, 93 acres overlaps Young Dodge Project Area- proposed to be implemented in 2012. The objectives of this thinning are to make the ponderosa pine component considerably less susceptible to mountain pine beetle attack, maintain ponderosa pine as the dominant species and to reduce ladder fuels.		X
	Approximately 20 acres/year of Christmas trees and other forest products are anticipated to be sold between 2012 and 2014.	X	X
	Salvage of blown-down trees may occur within and adjacent to the Project Area after appropriate analysis is conducted. For the purposes of this analysis, an estimated 20 acres of blowdown salvage per year for the 10 year planning period was assumed, for a total of 200 acres. This estimate is based on past experience with blowdown on the Rexford Ranger District in the Decision Area and similar drainages.	X	X
Cattle Grazing	225 cow/calf pairs are permitted to graze on the West Kootenai allotment from approximately May 15 to September 30. Actual use for the past several years has averaged around 180 pairs.	X	X
Noxious Weed Treatment	Efforts to treat present infestations of noxious weeds and to eradicate infestations of new invaders are ongoing. Most herbicide treatments are conducted along existing roads; a few treatments occur in timber harvest units. All activities will comply with the Kootenai National Forest Invasive Plant Management ROD (2007).	X	X
Fire Suppression	Control of wildfires will follow Forest Plan standards for the affected Management Area(s). Activities may include construction of fire lines, safety zones, and helispots by hand and equipment.	X	X
Road Management	Routine road maintenance will occur as needed on Roads 303, 470, 7202, 7205, and 7220 in the Project Area, separate from any road maintenance identified in this document. Maintenance includes road blading, gate repair/replacement, cleaning ditches and culverts, installing culverts, replacing culverts with larger diameter culverts, installing drain dips and surface water deflectors, placing riprap to armor drainage structures, placement of aggregate, brushing, and debris removal. Approximately 33 miles/year.	X	X

	Administrative use of roads in the Project Area will be ongoing. Use is associated with road maintenance, permit administration, noxious weed control, data collection, monitoring, and general administration of public lands. Road use will follow Forest and/or District use policies.	X	X
Recreation Maintenance	Routine maintenance will occur on the approximately 10 miles of non-motorized trails in the Project Area. Maintenance may include brushing; removing blowdown, debris, and hazard trees; repairing or adding waterbars, repairing treads; repairing or replacing signs; and improving vistas.	X	X
Special Uses	Two outfitter/guides are active during the big-game hunting season on the District, and may be active in the Project Area. The outfitters/guides and their clients (typically one to two persons) hike trails and closed roads two to four times during the hunting season to access known game areas. There are 22 special use permits including road access to private property, utility lines, water lines, a gravel pit, Montana Fish, Wildlife, and Parks fish weir, and the West Kootenai Fire Station.	X	X
Public Use	Recreational use of the Project Area is expected to include hiking, camping, fishing, hunting, photography, berry picking, other forest product gathering (mushrooms, cones, and boughs), Christmas tree cutting, firewood gathering, driving for pleasure, mountain biking, sightseeing, wildlife viewing, cross country skiing, snowshoeing, trapping, and snowmobiling.	X	X
Private Property	Analyses were conducted assuming that land owners are following current laws and regulations pertaining to activities conducted on their properties. Analyses conducted will assume that 5 private residences would be constructed each year in 2011 and 2012. No subdivisions are currently being formally proposed at this time.	X	X
Other Agency	The Montana Department of Fish, Wildlife & Parks is proposing to commercially thin approximately 50 acres in the wildlife management unit located at T37N, R28W, portions of Sections 3, 4, and 10. The purpose of the thinning would be to create a fire break adjacent to roads in the area. The thinning would occur for approximately one hundred feet on each side of the road for approximately two miles of road. Additional sites may be thinned as needed. The project is scheduled to be completed by 2015.		X

RELATIONSHIP TO THE FOREST PLAN

The Kootenai National Forest Plan (Forest Plan), and its accompanying Environmental Impact Statement and Record of Decision, specify the overall direction by which the resources of the Forest are managed. The Forest Plan consists of forest-wide and area-specific goals, objectives, guidelines, and standards that provide for land uses with anticipated resource outputs. Forest-wide Goals and Objectives pertinent to the Proposed Action were discussed in the Purpose and Need for Action in Chapter I. A description of area-specific goals, standards, and guidelines follow.

The Young Dodge FSEIS is tiered to the Environmental Impact Statement for the Forest Plan, and incorporates the management direction found in the Forest Plan. This FSEIS is not a general management plan for the Project Area, nor is it a programmatic document. It is a site-specific link between the Forest Plan and the requirements established by NEPA, which involves the analysis and implementation of management practices designed to achieve the goals and objectives specified in the Forest Plan. This FSEIS will discuss the Proposed Action and its alternatives in a site-specific manner as required by NEPA.

FOREST PLAN MANAGEMENT AREA DIRECTION

The Forest Plan divided the Forest into management areas (MA), each of which has goals, standards, and schedule of management practices (USDA Forest Service 1987a III-1-126). The Project Area contains MAs 2, 2 og, 10, 11, 12, 13, 15, 16, and 24. Timber harvest and prescribed burning is proposed for suitable sites in MAs 2, 10, 11, 12, 15, and 16.

Table 3-1 displays the MAs, their management emphasis, and the number of acres and percentages in the Project Area.

Table 3- 3 Management Area Summary

MA	Management Emphasis	Acres	% of Decision Area
2	**Semi-Primitive Non-Motorized Recreation** **Description:** Naturally-appearing areas with vegetation cover ranging from full timber to open meadows, which offer roadless recreation opportunities. **Goals:** Provide for the protection and enhancement of areas for roadless recreation use and to provide for wildlife management where specific wildlife values are high.	2168	6
10	**Big Game Winter Range (Unsuitable Timberland)** **Description:** Occurs on lands used by most species of big game (elk, moose, sheep, whitetail and mule deer) for winter range. **Goals:** Maintain or enhance habitat effectiveness for winter use by big game species and maintain the viewing resource in areas of high visual significance.	1408	4
11	**Big Game Winter Range (Suitable Timberland)** **Description:** Occurs on lands used by most species of big game for winter range. It is found at lower elevations in most drainages, and the topography ranges from steep to moderate and rolling topography. **Goals:** Maintain or enhance habitat effectiveness for winter use by big game species while producing a programmed yield of timber, and maintain the viewing resource in areas of high visual significance.	7984	21
12	**Big Game Summer Range** **Description:** Occurs mostly above 4,000 feet on moderate terrain; used by most species of big game from late spring through late fall. **Goals:** Maintain or enhance habitat effectiveness for non-winter big game habitat, and produce a programmed yield of timber.	13,217	35

MA	Management Emphasis	Acres	% of Decision Area
13 *	**Designated Old Growth Timber** **Description:** Existing old growth or mature timber stands which contain components of old growth. **Goals:** Provide the specialized habitat necessary for old growth dependent wildlife on a minimum of 10% of each major drainage on the Forest.	2948	8
15	**Timber Production** **Description:** Generally located at medium elevations on moderate topography and characterized by its ability to produce timber volumes suitable for harvest using conventional methods. **Goals:** Focus on timber production using standard silvicultural practices while providing for other resource values.	3778	10
16	**Timber with Viewing** **Description:** Generally occurs at medium elevations, and is characterized by productive forest land which has moderate viewing sensitivity. Usually in the midground or background as viewed from major travel corridors or the foreground or midground of secondary travel corridors. **Goals:** Produce timber while providing for a pleasing view. Wildlife habitat will be managed to provide for viable populations of existing native species.	903	2
24	**Low-Productivity Lands** **Description:** Generally occurs in small parcels at mid to high elevations and has relatively little productive capacity for many of the surface resources on the Forest. **Goals:** Manage for site protection, primarily, and for any wildlife resources that may be inherent.	195	1
PVT	**Private/State**	5281	14

*MA 13 does not include those areas managed for old growth (og) that are located in MA 2 (677 acres). Please refer to the old growth section, under Wildlife Resources for more information on the old growth analysis that was conducted as part of this project.

Refer to MAP 3-1 at the end of Chapter III for a map of the MAs in the Project Area

SOILS

INTRODUCTION

This section discloses the results of the analysis for the soils resource in the Young Dodge Analysis Area. Field surveys for this project were conducted in 2006 and 2007. All potential activity units were field verified for past disturbance. Where past disturbance was found, full surveys were conducted using the R1 Soils Protocol.

REGULATORY FRAMEWORK

The regulatory framework pertaining to soils is summarized below. For additional information, please refer to the Soil and Water Regulatory Framework in the Soil and Water Project File.

STATE AND FEDERAL LAWS AND REGULATIONS

The regulatory framework providing direction for protecting a site's inherent capacity to grow vegetation comes from the following principle sources:

- The Multiple Use-Sustained Yield Act of 1960
- The National Forest Management Act of 1976 (NFMA)
- The Forest Plan and Regional Soil Quality standards (2554.03-R1 Suppl. 2500-99-1)

The Multiple Use-Sustained Yield Act of 1960 directs the Forest Service to achieve and maintain outputs of various renewable resources in perpetuity without permanent impairment of the land's productivity.

Section 6 of the National Forest Management Act of 1976 (NFMA) requires that lands are to be managed to ensure the maintenance of long-term soil productivity, soil hydrologic function, and ecosystem health. Soil resource management will be consistent with these goals. To comply with NFMA, the Chief of the Forest Service has charged each Forest Service Region with developing soil quality standards for detecting soil disturbance and indicating a loss in long-term productive potential. These standards and guidelines are built into Forest Plans.

The Regional Soil Quality Standards (R-1 Supplement 2500-99-1) were revised in November 1999. Manual direction recommends maintaining 85% of an activity area's soil at an acceptable productivity potential with respect to detrimental impacts, including the effects of compaction, displacement, rutting, severe burning, surface erosion, loss of surface organic matter, and soil mass movement. This recommendation is based on research indicating that a decline in productivity would have to be at least 15% to be detectable (Powers 1991). In areas where more than 15 percent detrimental soil conditions exist from prior activities, the cumulative detrimental effects from project implementation and restoration should not exceed the conditions prior to the planned activity and should move toward a net improvement in soil quality. These standards do not apply to intensively developed sites such as permanent roads/landings, mines, developed recreation and administrative sites.

FOREST PLAN DIRECTION

The Kootenai National Forest Plan was developed in 1987. The following standards and guidelines apply to soils and form the basis for this analysis.

Objectives

Ground-disturbing activities such as road construction, road reconstruction, and timber harvest will be accompanied by mitigating measures to prevent or reduce increases in sedimentation and stream channel erosion. The amount of harvest allowed will depend on the rate of hydrologic recovery after timber has been removed (Volume 1 p II-7).

Each project plan for which the use of heavy equipment is required shall evaluate the effect of operating that equipment on soil productivity. When it is determined that equipment operation is a hazard to soil productivity the project shall:

- Establish a standard for how much of the project area will be allocated to skid trails, landings, temporary roads, or similar areas of similar areas of concentrated equipment travel. The standard shall minimize the area allocated to those uses to the extent practical.
- Consider the potential hazard to soil productivity before planning the practices requiring the operation of equipment off established roads and trails. Practices such as dozer piling of brush or mechanical site preparation shall not be planned without considering the feasibility of limiting the soil conditions under which these practices are applied or alternative practices that do not require the use of equipment (Volume 1 p II-7).

Standards

Soil and water conservation practices as outlined in the R1/R4 Soil and Water Conservation Practices will be incorporated into all land use and project plans as a principle mechanism for controlling non-point pollution sources and meeting soil and water goals, and to protect beneficial uses. Activities found not in compliance with soil and water conservation practices or State standards will be brought into compliance, modified, or stopped (Volume 1 p II-23). Best Management Practices consist of state-of-the-art practices that fulfill Forest Plan objectives.

Each project plan for which the use of heavy equipment is required shall evaluate the effect of operating that equipment on soil productivity as described in the Soil and Water objectives of [the Forest Plan] (Volume 1 p II-24).

ANALYSIS AREA AND METHODS

ANALYSIS AREA

The direct, indirect, and cumulative effects of the alternatives will focus on individual activity areas as defined by the Forest Service Manual (R-1 Supplement No. 2500-99-1):

"Activity Area: A land area impacted by a management activity to which soil quality standards are applied. Activity areas include harvest units within timber sale areas, prescribed burn areas, and grazing areas or pastures within range allotments. Inclusion of system roads within the activity area is dependent on analysis objectives. System roads are often evaluated separately; however, temporary roads, landings, and skid trails are included within an activity area. Riparian and other environmentally sensitive areas may be monitored and evaluated as individual activity areas within larger management areas."

For this analysis, activity areas are the proposed harvest, fuel treatment, and ecosystem burning units. Temporary roads, skid trails, landings, and fire lines within activity units are considered in evaluating effect to the soil resource.

ANALYSIS METHODS

Existing Condition

Existing conditions for the soils resource were determined using timber stand records, aerial photography, GIS data, and on-the-ground visits. Landtypes and hazard ratings were gathered from landtype descriptions and characteristics described in the Soil Survey of Kootenai National Forest Area, Montana and Idaho (Kuennen and Gerhardt 1995).

Existing conditions and impacts are based on soil disturbance values derived from on-the-ground field surveys of all of the units in the proposal. All units were visited to identify whether disturbance existed within the unit. If a unit was found to have disturbance, a full qualitative field survey was conducted using R1 Soil Survey Procedures. Field surveys consisted of random stratified transect/sample point methods with confidence intervals at or above 80% ± 5% with the majority of surveys being 95% ± 5%. Completed soil survey forms can be found in the Soil and Water Project File and/or District Files. Existing detrimental soil disturbance numbers are a result of all currently measurable effects of past actions in each activity area, including but not limited to: timber harvest (trails and landings), grazing, temporary road construction, off highway vehicles, natural disturbances, firewood gathering, etc. These methods provide data that is used in the analysis to determine if Forest Plan and Regional Soil Quality Standards would be met.

Direct and Indirect Effects

The potential detrimental soil disturbance (DSD) values were calculated based on a summation of past monitoring of soil productivity within the Kootenai National Forest (Soils Table 3-1). The percentages were developed as an average soil disturbance level and equated to harvest equipment type, fuel treatment methods, and season of operation. The DSD percentages included the effects of compaction, erosion, burning, rutting, and displacement on soils. New temporary roads are considered 100% detrimentally disturbed through removal of organic matter, displacement, and/or compaction. Temporary roads yield 2 acres of DSD per mile of road.

Soils Table 3- 1 Monitoring Results of Detrimental Soil Disturbance from Management Activities on the Kootenai (Kuennen 2007)

Management Activity	Season of Operation	Percent Detrimental Disturbance (Last 5 Years) [2]
Skyline	NA	1
Tractor (Summer)	Summer	8
Tractor (Winter)	Winter	4
Forwarder (Summer)	Summer	4
Forwarder (Winter)	Winter	2
Helicopter	NA	0
Excavator Piling[1]	NA	2
Fireline Construction[1]	NA	1
Grazing[1]	NA	2

[1] DSD percent is listed but is not necessarily additive to other activities. This is because the percentages listed for each management activity included some units with excavator piling, fire line construction, and/or grazing in their data set. In addition, disturbance from these activities within harvest units usually overlaps with the skidding disturbance.

[2] The numbers for this document were based on percentages from the last five years. Previous documents have used eighteen year averages. Typically the larger data set is more accurate, but because the eighteen year data set included practices that are not used anymore (i.e. dozer piling) it was deemed more appropriate to use the more accurate information pertaining to modern harvest and slash disposal methods.

Compaction, rutting, displacement, and severe burning can affect the soils physical, chemical, and biological properties, which indirectly can affect the growth and health of trees and other plants. Compaction and rutting reduces soil permeability and infiltration, which can cause soil erosion. Displacement reduces plant growth where topsoil and organic matter are removed. Severely burned soils can become hydrophobic (water repellent) and lead to increased erosion, runoff, and/or reduced productivity.

Generally, detrimental effects on soils are not permanent and depend primarily on soil texture, parent material, aspect, and level of disturbance, i.e. compaction. Recovery begins once activities cease on the site. However, vegetative recovery time may take approximately 30 to 70 years as the second growth timber becomes established in and around the disturbed areas (Dykstra and Curran 2002; Froehlich and McNabb 1983; Froehlich and others 1983 and 1985).

Indirect effects may include the reduction of site productivity due to the removal of vegetation and nutrients. Large woody debris (woody residue >3” diameter) and finer organic material are essential for maintenance of sufficient microorganism populations and long-term site productivity. Design features (see Design Criteria) are incorporated into the activities to manage large woody debris and organic matter as detailed in the research guidelines contained in Graham and others (1994). Where feasible, smaller woody material such as tree tops, foliage, and branches would be left to over-winter before fuels treatment, which allows nutrients to leach out of these materials and into the soil.

Cumulative Effects

Cumulative effects include the combination of direct and indirect effects from past, present, and reasonably foreseeable activities. Direct, indirect, and cumulative effects on soils are measured within each activity area. Existing system roads and designated landings on the National Forest transportation system are considered dedicated lands and are not part of the cumulative effects. Permanent roads systems are analyzed in the Water Resources Section.

ASSUMPTIONS AND LIMITATIONS

The potential detrimental disturbance numbers for each proposed harvest unit are based on empirically derived coefficients that were obtained and averaged from numerous monitored sites throughout the Kootenai National Forests (Kuennen 2003; Kuennen 2007). The assumptions are limited to the harvest and slash disposal methods for which coefficients have been determined, and its coefficients assume that Best Management Practices (BMPs) will be implemented. The predicted values do not account for changes in soil type, the recovery of soils over time, or existing conditions. However, similar results were found across the landtypes on the forest.

Evaluation of cumulative effects to soil productivity does not require an integrated “watershed scale” assessment since that is not considered an appropriate geographic area. Soil conditions are site-specific. Loss of soil productivity in one treatment unit will not lead to a loss in soil productivity in an adjacent stand or other areas across a watershed. Soil productivity can vary from one square foot to the next with each area functioning independently. Thus, the highly variable and independent nature of soil productivity requires site-specific analyses to maintain the proper context. Assessments of cumulative effects on soil productivity at scales larger than the specific treatment unit boundary (such as the watershed scale) misrepresent the effects of management activities by masking and/or diluting the site-specific effects across a larger area. In contrast, soil processes such as erosion regime and hydrologic functions occur at a watershed scale and have been analyzed as such in Water Resources.

AFFECTED ENVIRONMENT

REFERENCE CONDITIONS

The majority of the land area on the Kootenai National Forest was influenced by glaciers. Glacial activity had the last major effect on shaping the landscape, especially north of the Clark Fork River.

The glacial activity resulted in considerable scouring and filling, creating a more subdued landscape than would have existed prior to glaciation. Generally, major ridge divides and smaller ridge tops were scoured leaving exposed, scraped rock. The scoured soil material was pushed around and tended to fill in topographic lows (drainage bottoms, etc.). The scouring of the ridge tops and filling of drainage bottoms gave the landscape a rounded appearance.

Glacial ice generally retreated from the area 12,000 to 15,000 years ago. The soil material left was composed of silts, fine sands, and rounded gravels and boulders. As the ice melted more landforms were created, consisting of outwash terraces, eskers, kames, and lacustrine terraces. Most of these landforms were created in and/or adjacent to the drainage bottoms.

Those areas not affected by glaciation and/or the scoured ridge tops with soils that are weathering "in place” are often referred to as residual soils. Typically, there is a good gradation of particle sizes. The amount of rock present is much higher than that associated with a glacial till soil. Rock shape is strongly angular.

Approximately 6800 years ago a volcanic eruption (Mt. Mazama) in the Cascades deposited a layer of volcanic ash-influenced loess over northwestern Montana forming the topsoil horizon in many local areas. This layer now exists on all aspects of the west half of the Forest, and on all northerly and easterly aspects and on higher elevation (generally above 4500 feet) southerly and westerly aspects of the eastern half of the Forest. This layer is light and feathery and has a brownish color.

The soils that resulted are glacial till, residual soils, and volcanic ash loess. The glacial till soils have a fine sand/silt particle size. They are light in color and contain 30 to 45 percent sub-rounded rocks. The residual soils have a mixture of sand, silt, and clay with sand and silt making up the majority of soil particles. There is a mixture of colors and contain from 55 to 75 percent angular rock. Where the volcanic ash is present, it forms the topsoil layer. It ranges in thickness from six to 12 inches and has a yellowish brown to reddish brown color.

From the eruption of Mt. Mazama to the early 1900s, soils in the Analysis Area were relatively undisturbed compared to the large-scale events described above. Naturally occurring surface erosion and small-scale landslides probably occurred on occasion, but their overall magnitude would have been insignificant in terms of long-term soil productivity in the Analysis Area. Recovery in these areas was attained when the slope reached a stable angle and/or the area was revegetated. Soil productivity was maintained over the long-term as vegetative matter decomposed or burned in low intensity wildfires.

Historically, the most prevalent large-scale disturbance in the Analysis Area was wildfire. Stand replacing fires varied in frequency from 50 – 300 years, depending on vegetation type and location. Once fire passed through an area, erosion increased, especially on steep slopes and in headwater swales where most vegetation was removed, until sufficient forest floor and canopy vegetation had recovered. Soils may have developed hydrophobic conditions following severe fires. However, soils on the Kootenai National Forest have shown little hydrophobicity following wildfires in recent decades, even when those fires burned very intensely; therefore, it is unlikely that this condition was common in the past. More frequent, low-intensity underburns likely had little effect on soils due to the short contact time and lower temperatures associated with these fires.

The increased human activity since 1900 has led to increases in soil disturbance and reduction in overall soil productivity on a small percentage of the area. Roads and trails were created to access timber and private land, creating soil displacement and compaction. Roads continue to be compacted as long as they are in use. Skid trails slowly recover starting from completion of the timber removal. Private land developments have been focused in valley bottoms of the drainages, and include the building of roads and structures, timber and riparian clearing, and livestock grazing. The main soil impacts have been displacement, compaction, and erosion.

EXISTING CONDITION

Existing condition is the result of the past management activities (temporary road construction, timber harvest, prescribed burning, etc.) and natural events (wildfire, floods, landslides, etc.) that occurred in the Analysis Area. These activities and events provide baseline conditions for the affected environment in the Analysis Area.

Soils are the basic support system of forest ecosystems, providing nutrients, water, oxygen, heat, and mechanical support to vegetation. Any environmental stressor that alters the natural function of the soil has the potential to influence the productivity, species composition, and hydrology of forest systems. Maintenance of soil quality is dependent upon the protection of surface layers from erosion, displacement, and compaction, as well as the continual cycling of nutrients and organic material. Soil quality refers to the capacity of a soil to function within ecosystem and land use boundaries, to sustain biological productivity, maintain environmental quality, and promote plant and animal health (Doran and Parkin 1994). Various factors influence soil quality. Although management activities do not affect factors such as climate and soil parent material, they can affect physical, chemical, biologic, and hydrologic soil properties.

The Analysis Area has been strongly influenced by continental glaciers. The glaciation generally scoured the ridge tops and noses and filled the side-slopes and the valleys. Terraces and rolling topography exist along the Koocanusa Reservoir and extend into Green's Basin. Elevation ranges from 2459 feet at high pool on the reservoir, to 7540 feet on top of Robinson Mountain.

The Analysis Area is underlain by metamorphic sedimentary rocks known as the Belt Formation. These rocks were formed approximately a billion years ago from fine sediments that accumulated at the bottom of ancient seas. These deposits were changed into hard dense rock formations under great pressure and heat. They form a relatively stable foundation for the watersheds in this area, more stable than watersheds in other areas dominated by granitic rock and soils that are prone to landslides and soil movement (Kuennen and Gerhardt 1995).

Soils in the Analysis Area consist mostly of glacial till with a surface layer of volcanic ash-influenced loess on all northerly aspects and higher elevation southerly aspects. The glacial till contains 35 to 45 percent sub-rounded rock and has a light-gray color. The fines within the till are mostly coarse silt. The loess material contains 15 to 30 percent rock and is rusty-brown colored. Water-influenced deposits (layered silts and stratified sands and gravels) exist along the reservoir and extend westerly up the drainage bottoms. Except for ridge noses and ridge tops, the soils are deep.

Three criteria were used to assess existing condition for soil resources:

- Kootenai National Forest **Landtypes**;
- Identification of **Sensitive Soils**; and
- **Site conditions in the activity areas** in which proposed activities would occur.

LANDTYPES

Kootenai National Forest Landtypes are based on landforms, geology, soils, vegetation, climate, and drainage type. They describe inherent conditions and do not change as a result of management. The landtypes were compiled in Kuennen and Nielsen-Gerhardt (1984), and published in Soil Survey of Kootenai National Forest Area, Montana and Idaho (Kuennen and Gerhardt 1995). Landtype classification helps determine suitability, equipment operating limitations, and the production potential of the landscape. It is an important tool for protecting soils during resource management activities. Refer to Map 1: Landtypes, in the Soil and Water Project File for spatial representation of the landtypes in the Analysis Area. The landtype map is generally quite accurate; however, field verification may indicate some site variability. The landtypes in the Analysis Area and their implications are displayed in Soils Table 3-2. For a detailed description of each landtype, see Kuennen and Gerhardt (1995).

Soils Table 3- 2 Landtypes in the Analysis Area (Kuennen and Gerhardt 1995)

Landtype	Acres	Timber Management		Road Construction/Maintenance		
		Tractor Operations	Sediment Hazard	Cut and Fill Slopes	Native Surface Material	Sediment Hazard
101	57	Soil Damage	Severe	None	Erosion	Severe
102	566	Soil Damage	Moderate	None	Rutting	Severe
105	96	N/A[1]	N/A[1]	None	None	Moderate
107	87	N/A[1]	N/A[1]	None	Erosion	Moderate
111	710	N/A[1]	N/A[1]	None	Rutting	Severe
114	948	N/A[1]	N/A[1]	None	Rutting	Severe
252	593	Slope	Severe	None	Rock Fall	Moderate
302	418	Slope	Moderate	Sloughing	Erosion	Moderate
303	403	Rock	Moderate	None	Large Stones	Slight
322	5594	Soil Damage	Moderate	Sloughing	Rutting	Severe
323	2783	None	Moderate	Sloughing	Rutting	Severe
324	8803	None	Moderate	Sloughing	Erosion	Moderate
352	7628	Slope	Moderate	Sloughing	Erosion	Moderate
353	67	Soil Damage	Moderate	None	None	Slight
355	3968	Rock	Moderate	None	None	Moderate
357	1413	Slope	Severe	Landslides	Large Stones	Severe
401	90	N/A[1]	N/A[1]	Avalanches	Large Stones	Moderate
403	533	N/A[1]	N/A[1]	Avalanches	Large Stones	Moderate
404	836	Soil Damage	Moderate	Raveling	Erosion	Moderate
405	1160	Slope	Moderate	None	Large Stones	Slight
406	701	Slope	Moderate	Raveling	None	Slight
407	391	Soil Damage	Severe	Raveling	Erosion	Severe

[1] Not applicable because landtype has only scattered stands of trees.

There are 50 recognized landtypes on the Kootenai National Forest. Twenty-two of these landtypes are found in the Analysis Area.

SENSITIVE SOILS

Sensitive Soils are identified based on one of three characteristics: 1) landtypes of concern, 2) riparian/wetland areas; and 3) low productivity soils. Sensitive soils comprise 20 percent of the Project Area. Sensitive soils are best addressed through avoidance, Best Management Practices (BMPs), buffers, and/or through design criteria.

Landtypes of Concern

There are soils on the Kootenai that require careful management; they have been designated “landtypes of concern,” and should be given additional consideration prior to the introduction of management activities (Kuennen 2007).There are seven landtypes of concern on the Kootenai National Forest; Landtypes 102, 112, 325, 351, 365, 370, and 520 (Kuennen 2007). Landtype 102 is the only landtype of concern within the Analysis Area. Please refer to Map 1: Landtypes, in the Soil and Water Project File for spatial representation of Landtype 102 in the Analysis Area. Landtype 102 makes up 566 acres, or one percent of the Analysis Area.

Riparian/Wetlands Areas

There are approximately 4800 acres (13%) default riparian habitat conservation areas (RHCAs), which include the riparian and wetland areas in the Analysis Area. These areas are displayed in Map 7: Riparian/Ponds/Streams, in the Soil and Water Project File. It is important to differentiate RHCAs from riparian areas and/or wetlands. Riparian and wetland soils are considered sensitive because their moisture levels are high all or most of the year, and moist soils are more prone to compaction, displacement, rutting, and/or puddling. The default RHCAs in most documents include the riparian/wetlands but also extend further into the dryer habitats. The default RHCAs were intentionally made larger to encompass varying landscapes and stream types. Where on-the-ground information exists, those default RHCAs could be modified to the actual riparian/wetland area boundaries.

Riparian areas are transition zones between permanently saturated wetlands and drier upland areas. These areas offer excess soil moisture that is reflected in soil and vegetation characteristics. Natural, undisturbed, or well-managed riparian areas provide values and benefits far in excess of the small percentage of land they occupy (Brooks et al 1997). Riparian areas maintain the integrity of aquatic ecosystems by: 1) influencing the delivery of sediment, organic matter, and large woody debris to streams; 2) providing root strength for channel stability; 3) shading the stream; and 4) protecting water quality (USDA Forest Service 1995). Where disturbance occurs in riparian areas, there is an increased risk of erosion and reduced productivity, thereby reducing the buffering affect that the riparian area has on streams and the protection of beneficial uses.

Wetlands are defined as having a water table near the ground surface or where the land is at least seasonally covered by shallow water. Wetland types within the Analysis Area consist of marshes, lakeshores, sloughs, bogs, fens, and wet meadows.

Low Productivity Soils

Soil productivity, as defined by Brady and Weil (2002), is “the capacity of a soil for producing a specific plant or sequence of plants under a specified system of management.” The most productive part of the soil occurs near the surface, at the contact between the forest litter and the mineral soil. Here the litter has decomposed into an organic rich layer containing most of the soil nitrogen, potassium, and mycorrhizae that must be present for a site to be productive. However, this is also the part of the soil that is easiest to disturb by management activities.

It is important to look at soil productivity to properly assess the effects of potential actions on a specific area. For instance, if timber harvest is proposed on a given area of land that was considered to have low soil productivity, additional actions may need to be taken to insure a fully stocked stand after harvest. Soil productivity levels for each landtype are classified as low, moderate, or high in Kuennen and Gerhardt (1995). Soils Table 3-3 displays the soil productivity of the landtypes in the Analysis Area.

Soils Table 3-3 Soil Productivity in the Analysis Area (Kuennen and Gerhardt 1995)

Landtype	Acres	Forest Vegetation Group	Relative Productivity
101	57	Moist, Mixed Forest	High
102	566	Dry to Moist, Mixed Forest	Moderate to High
105	96	Non-Forested	N/A[1]
107	87	Non-Forested	N/A[1]
111	710	Non-Forested	N/A[1]
114	948	Non-Forested	N/A[1]
252	593	Moist, Mixed Forest	High
302	418	Dry, Mixed Forest	Moderate
303	403	Open-grown Forest	Low
322	5594	Moist, Mixed Forest	High
323	2783	Dry, Mixed Forest	Moderate
324	8803	Dry, Mixed Forest	Moderate
352	7628	Moist, Mixed Forest	High
353	67	Rocky Sub-alpine to Moist, Mixed Forest	High
355	3968	Moist, Mixed Forest	High
357	1413	Moist, Mixed Forest	High
401	90	Non-Forested	N/A[1]
403	533	Non-Forested	N/A[1]
404	836	Moist, Mixed Forest	High
405	1160	Sub-alpine Forest	Low
406	701	Sub-alpine Forest	Low
407	391	Moist, Mixed Forest	High

[1] Not applicable because landtype has only scattered stands of trees.

The majority of the Analysis Area has moderate to high soil productivity. However, landtypes 303, 405, and 406 are rated as having low soil productivity. This equates to 2264 acres or six percent of the Analysis Area being identified as having low soil productivity.

SITE CONDITIONS IN THE ACTIVITY AREAS

Site Conditions are considered for each activity area in the effects analysis portion of this assessment. Past activities in the Analysis Area have resulted in impacts that persist today. Past activities affecting soils include, but are not limited to, road construction, timber harvest (including skid trails and landings), prescribed and wildfire, cattle grazing, firewood gathering, and off-road vehicle use. Percent detrimental soil disturbance is defined by agency directives for Soil Quality Monitoring found in the FSM R-1 Supplement No. 2500-99-1. The following are the categories of detrimentally disturbed soils identified in FSM R-1 Supplement: Compaction, Rutting, Displacement, Surface Erosion, Severely Burned Soil, and Mass Movement (Landslides). All types of detrimental soil disturbance listed in FSM 2554.1.1 will be considered in the examination of the existing condition and in the analysis of environmental effects.

The three activities that have had the most impact on soils in the Analysis Area are livestock grazing, road construction, and timber harvest.

Livestock Grazing

Livestock grazing impacts generally occur in localized areas where cattle tend to congregate season after season (areas offering good forage). Generally these areas include riparian zones (water sources), harvest units, road corridors, and meadows. Stream bank trampling/shearing occurs when cattle cross a stream and collapse the banks. This can lead to an increase in bank scour during high flows. Compaction and stream bank trampling/shearing are among the most common soil disturbances resulting from grazing (Thurow 1991; Kauffman et al 1983). Within the Analysis Area, grazing impacts tend to be discontinuous and localized. There is one range allotment within the Analysis Area, the West Kootenai Allotment. A maximum of 225 cow/calf pairs are allowed on the allotment from May 15 to September 30. Actual use for the past several years has averaged around 180 pairs. Conditions are good within the allotment, due to light-to-moderate use by cattle (West Kootenai and Boulder/Scalp Mountain Grazing EA 1998). The steepness of slopes and distance to water tend to limit cattle use. For further analysis with regard to range allotments and grazing refer to the Range Specialist Report.

Road Construction

Common impacts to soils from road construction are displacement, compaction, and erosion (road-related runoff). Road building has accompanied most other management activities. Road construction affects soils by displacing the topsoil layers from the road prism and compacting the road surface and shoulders. The surface of the road will not support trees and other forest vegetation as long as the road is used and maintained. Trees and shrubs will grow along the road bank, but site productivity is less than in unaffected soils. Roads also disrupt hydrologic processes that occur within the soil profile. The cut slope intercepts subsurface flow and the compacted road surface reduces precipitation infiltration. As long as roads remain on the landscape, the impacts to soils persist. When road use ceases, soils gradually begin to recover. Implementation of BMPs reduces erosion and the rerouting of water associated with roads. Refer to the Transportation Specialist report for more detailed information about specific road conditions and roads analysis. There are 274 miles of existing road within the Analysis Area. Of the total, 199 miles are Forest System Roads (refer to Map 6 in the Soil and Water Project File). The permanent road system does not count toward the 15% detrimental soils standard. This is due to the road system not being considered part of the suitable timber land base. However, temporary roads, excavated skid trails, and landings do contribute toward the 15% standard.

Timber Harvest

Timber harvest activities have occurred in the Analysis Area since the turn of the 19th century. Two of the more important impacts to soils are detrimental soil disturbance (compaction, displacement, rutting, etc.) and removal of organic matter. Soil disturbance as a result of timber harvest and fuels reduction is usually associated with mechanized activity. Timber harvest activities can physically alter soils and reduce soil organic matter, which can lead to reduced site quality and soil productivity. Detrimental soil disturbance is defined by FSM 2500-99-1 and typically is the result of compaction, displacement, or rutting. Soil compaction results from the packing together of soil particles due to increased pressure on the soil surface. Compaction associated with equipment is often accompanied by the formation of ruts, which collect and concentrate runoff, thus increasing erosion. The loss of surface organic matter through mechanical removal or burning can cause nutrient and carbon cycle deficits and negatively affect physical and biological soil conditions.

Soil compaction impacts recover over time due to freeze-thaw action, burrowing by animals, plant root growth, and the action of soil microbes. Soil erosion and displacement are impacts that require a longer timeframe to recover since the rate of soil formation is very slow. Long-term soil processes are influenced by fire, mass wasting, wind-deposition, and weathering of parent material at the rate of one inch of topsoil formed every 300-1000 yrs (Thurow 1991). Timber harvest, both regeneration and intermediate, has taken place on 20,319 acres of the Analysis Area (refer to Map 4 in the Soil and Water Project File).

DIRECT AND INDIRECT EFFECTS

Direct and indirect effects on the soils resource are described below for proposed activities identified in Chapter 2.

MEASUREMENT INDICATORS

No significant issues were identified for Soil Resources during the scoping process. Therefore, law, regulation, and policy drive the effects analysis.

Effects of the Alternatives on soil resources will be analyzed in terms of:

- Activities on **Sensitive Soils**;
- **Detrimental Soil Disturbance** and the 15% Standard;
- **Prescribed Fuels Treatments**; and
- Changes in **Nutrient Cycling**.

SENSITIVE SOILS

Soils Table 3-4 displays the acres of management activities located on sensitive soils by alternative.

Soils Table 3- 4 Unit Acres on Sensitive Soils

Sensitive Soils	Alt 1	Alt 1M	Alt 2	Alt 3
Harvest Unit Acres on Sensitive Landtype 102	0	0	0	0
Underburn/Mechanical Pile Unit Acres on Landtype 102	64	64	0	0
Harvest Unit Acres on Riparian/Wetlands	0	0	0	0
Underburn/Mechanical Pile Unit Acres on Riparian/Wetlands	0	0	0	0
Harvest Unit Acres on Low Productivity Soils	0	0	0	0
Underburn/Mechanical Pile Unit Acres on Low Productivity Soils	480	456	0	235
Total Timber Harvest Acres on Sensitive Soils	0	0	0	0
% of Project Area with Timber Harvest on Sensitive Soils	0%	0%	0%	0%
Total Underburn/Mechanical Piling Acres on Sensitive Soils	544	456	0	235
% of Project Area with Underburn/Mechanical Piling on Sensitive Soils	1%	1%	0	1%

Effects of the No Action Alternative 2 – Sensitive Soils

Alternative 2 does not propose any new management activities on sensitive soils. Therefore, no direct, indirect, or cumulative effects to sensitive soils would result from Alternative 2.

Direct and Indirect Effects of the Action Alternatives– Sensitive Soils

No harvest activities or other mechanical treatments are proposed on Landtype 102 with Alternatives 1, 1M, or 3. However, in Alternatives 1 and 1M, a portion of Unit 216 is proposed on Landtype 102. Unit 216 is an 'underburn only' unit. Burning would not create additional compaction or rutting, the primary concerns with Landtype 102.Therefore, no direct or indirect effects to sensitive landtypes would result from timber harvest activities in Alternatives 1, 1M, or 3.

No harvest activities are proposed in riparian areas or wetlands with Alternatives 1, 1M, or 3. Therefore, there would be no direct effects to riparian areas or wetlands. However, the project does modify RHCAs rather than use default buffers. Modifying RHCAs involves identifying the boundaries where they actually exist on the ground (extent of riparian vegetation) versus using a one-size-fits-all default number. However, RHCAs cannot be reduced to less than the SMZ boundary width required by law. As a result, one indirect effect to riparian areas and wetlands could be an increase in blown down trees or additional large woody debris from opening the stands in and around wet areas.

There are no timber harvest activities proposed on landtypes with low soil productivity with Alternatives 1, 1M, or 3. However, there are portions of two underburn with mechanical treatment units (Units 9 and 46) and three underburn-only units (Units 10, 110 and 120) on low productivity soils for all Action Alternatives. Proposed activities include burning, slashing and/or excavator piling, but would leave a fully stocked stand post-activity. This would allow for a continuous input of nutrients through needle-cast and coarse woody debris and would maintain soil productivity.

In summary, there are no timber harvest activities proposed on any of the categories of sensitive soils with Alternatives 1, 1M, or 3. Some fuels management activities are prescribed on a small portion of each Action Alternative. The actions are not expected to result in measurable effects on sensitive soils because there is little or no soil disturbance resulting from the activities proposed and where the fuels activities are proposed on sensitive soils, a fully stocked stand of timber would remain post-activity.

DETRIMENTAL SOIL DISTURBANCE (DSD)

Management activities including, but not limited to, road building, off-highway vehicle use, timber harvest (trails and landings), mechanical fuel treatment, firewood gathering, and grazing are considered to be potential sources of detrimental soil disturbance. Refer to Map 4 in the Soil and Water Project File for spatial representation of past harvest activities.

Soils Table 3-5 displays existing, proposed, and cumulative detrimental soil disturbance for each activity area. Existing disturbance is based on field surveys. Predicted detrimental and foreseeable activity disturbance is based on information from Kuennen 2003 and 2007, which includes a summary of all Kootenai Forest Soils Monitoring to date with recommendations for analysis based on survey results. Please refer to the Soil and Water Project File to review these documents. The cumulative percentage is derived by adding the percentage of disturbance expected from proposed activities and reasonably foreseeable activities to the existing disturbance percentage. All harvest activities, prescribed burning, skid trails, landings, fire lines, excavator piling, and temporary roads are included in this analysis. BMPs would be followed (Appendix 2), and additional design criteria have been specified in order to minimize disturbance (refer to the Management Requirements and Design Criteria II-32).

Soils Table 3- 5 Predicted Percent Detrimental Soil Disturbance by Alternative

Unit	Alt 1[1]	Alt 1M[1]	Alt 2[1]	Alt 3[1]
1	5 + 2 + 0 = 7	5 + 2 + 0 = 7	--[2]	5 + 2 + 0 = 7
2	5 + 8 + 0 = 13	5 + 8 + 0 = 13	--[2]	5 + 8 + 0 = 13
3	4 + 2 + 0 = 6	4 + 2 + 0 = 6	--[2]	4 + 2 + 0 = 6
4	7 + 0 + 0 = 7	7 + 0 + 0 = 7	--[2]	7 + 0 + 0 = 7
5	0 + 2 + 0 = 2	0 + 2 + 0 = 2	--[2]	--[2]
6	3 + 8 + 0 = 11	3 + 8 + 0 = 11	--[2]	3 + 8 + 0 = 11
7	2 + 0 + 0 = 2	2 + 0 + 0 = 2	--[2]	2 + 0 + 0 = 2
8	5 + 0 + 0 = 5	5 + 0 + 0 = 5	--[2]	5 + 0 + 0 = 5
9	2 + 0 + 0 = 2	2 + 0 + 0 = 2	--[2]	2 + 0 + 0 = 2
10	8 + 2 + 0 = 10	8 + 2 + 0 = 10	--[2]	8 + 2 + 0 = 10
12	6 + 8 + 0 = 14	6 + 8 + 0 = 14	--[2]	6 + 8 + 0 = 14
13	0 + 2 + 0 = 2	0 + 2 + 0 = 2	--[2]	--[2]
14	0 + 2 + 0 = 2	0 + 2 + 0 = 2	--[2]	--[2]
16	0 + 8 + 0 = 8	0 + 8 + 0 = 8	--[2]	0 + 8 + 0 = 8
17	0 + 8 + 0 = 8	0 + 8 + 0 = 8	--[2]	0 + 8 + 0 = 8
19	4 + 4 + 0 = 8	4 + 4 + 0 = 8	--[2]	4 + 4 + 0 = 8
21	6 + 8 + 0 = 14	6 + 8 + 0 = 14	--[2]	6 + 8 + 0 = 14
23	0 + 8 + 0 = 8	0 + 8 + 0 = 8	--[2]	0 + 8 + 0 = 8
24	0 + 8 + 0 = 8	0 + 8 + 0 = 8	--[2]	0 + 8 + 0 = 8
25	0 + 8 + 0 = 8	0 + 8 + 0 = 8	--[2]	0 + 8 + 0 = 8
26	--[2]	--[2]	--[2]	0 + 8 + 0 = 8
28	--[2]	--[2]	--[2]	0 + 8 + 0 = 8
29	0 + 1 + 0 = 1	0 + 1 + 0 = 1	--[2]	0 + 1 + 0 = 1
30	0 + 8 + 0 = 8	0 + 8 + 0 = 8	--[2]	0 + 8 + 0 = 8
38	2 + 1 + 0 = 3	2 + 1 + 0 = 3	--[2]	2 + 1 + 0 = 3
40	2 + 8 + 0 = 10	2 + 8 + 0 = 10	--[2]	2 + 8 + 0 = 10
46	0 + 0 + 0 = 0	0 + 0 + 0 = 0	--[2]	0 + 0 + 0 = 0
47	4 + 8 + 0 = 12	4 + 8 + 0 = 12	--[2]	4 + 8 + 0 = 12
48	0 + 0 + 0 = 0	0 + 0 + 0 = 0	--[2]	--[2]
49	0 + 0 + 0 = 0	0 + 0 + 0 = 0	--[2]	0 + 0 + 0 = 0
50	0 + 0 + 0 = 0	0 + 0 + 0 = 0	--[2]	0 + 0 + 0 = 0
51	0 + 0 + 0 = 0	0 + 0 + 0 = 0	--[2]	0 + 0 + 0 = 0
52	7 + 2 + 0 = 9	7 + 2 + 0 = 9	--[2]	7 + 2 + 0 = 9
53	0 + 8 + 0 = 8	0 + 8 + 0 = 8	--[2]	0 + 8 + 0 = 8
54	--[2]	--[2]	--[2]	4 + 8 + 0 = 12
103	2 + 2 + 0 = 4	2 + 2 + 0 = 4	--[2]	2 + 2 + 0 = 4
110	--[2]	--[2]	--[2]	8 + 2 + 0 = 10
111	6 + 2 + 0 = 8	6 + 2 + 0 = 8	--[2]	6 + 2 + 0 = 8
112	5 + 8 + 0 = 13	5 + 8 + 0 = 13	--[2]	5 + 8 + 0 = 13
116	3 + 1 + 0 = 4	3 + 1 + 0 = 4	--[2]	3 + 1 + 0 = 4
118	0 + 2 + 0 = 2	0 + 2 + 0 = 2	--[2]	0 + 2 + 0 = 2
120	8 + 2 + 0 = 10	8 + 2 + 0 = 10	--[2]	8 + 2 + 0 = 10
125	0 + 0 + 0 = 0	0 + 0 + 0 = 0	--[2]	0 + 0 + 0 = 0
129	0 + 1 + 0 = 1	--[2]	--[2]	0 + 1 + 0 = 1
138	3 + 8 + 0 = 11	3 + 8 + 0 = 11	--[2]	--[2]

Unit	Alt 1[1]	Alt 1M[1]	Alt 2[1]	Alt 3[1]
201	5 + 8 + 0 = 13	5 + 8 + 0 = 13	--[2]	--[2]
203	--[2]	--[2]	--[2]	4 + 2 + 0 = 6
211	5 + 8 + 0 = 13	5 + 8 + 0 = 13	--[2]	5 + 8 + 0 = 13
212	6 + 8 + 0 = 14	6 + 8 + 0 = 14	--[2]	6 + 8 + 0 = 14
216	2 + 0 + 0 = 2	2 + 0 + 0 = 2	--[2]	--[2]
220	6 + 8 + 0 = 14	6 + 8 + 0 = 14	--[2]	6 + 8 + 0 = 14
221	--[2]	0 + 8 + 0 = 8	--[2]	--[2]
222	--[2]	0 + 8 + 0 = 8	--[2]	--[2]
223	--[2]	6 + 8 + 0 = 14	--[2]	--[2]
225	--[2]	--[2]	--[2]	0 + 8 + 0 = 8
325	--[2]	--[2]	--[2]	0 + 8 + 0 = 8

[1] Existing + Proposed + Reasonably Foreseeable = Cumulative

[2] -- Indicates that the unit was not included in this alternative.

Note: An existing condition of 0 can mean either: 1. No disturbance is present or 2. There is some disturbance present, but does not amount to 1%.

Effects of the No Action Alternative 2 – DSD

Alternative 2 does not propose any new management activities that would result in DSD. Therefore, no direct, indirect, or cumulative DSD would result from Alternative 2. Existing detrimental disturbance would continue to slowly recover.

Direct and Indirect Effects of the Action Alternatives – DSD

Direct impacts on soils from management activities could include compaction, rutting, and displacement. Typically these impacts take place as a result of vehicles/equipment traversing areas within proposed units such as skid trails, landings, and temporary roads. Soils Table 3-5 identifies the extent of these impacts for each unit for Alternatives 1, 1M, and 3. To minimize anticipated effects, BMPs (Appendix 2) and the following specific management requirements and design criteria would be used to the extent possible:

- Avoid sensitive soils.
- Use excavator for mechanized slash piling and fire line construction.
- Operate equipment over a slash mat where feasible.
- Ground-based operations would occur over dry, frozen, or snow-covered ground.
- Use existing skid trails and landings where feasible.

Alternatives 1, 1M, and 3 all include underburning with and without timber harvest. The impacts to soils from burning activities are discussed in the next section. Underburning may require construction of firelines around the unit; the effects of this disturbance are included in the figures identified in Soils Table 3-5. The construction of a fire line directly impacts soils by removing (displacing) the organic layer down to mineral soil for 2-3 feet wide around the perimeter of the units. Some compaction along the fire line could occur from foot, all-terrain vehicle, and/or heavy equipment traffic. Fuels treatments may also include mechanical piling. The effects of mechanical piling are included in the figures identified in Soils Table 3-5. The direct effects of mechanical piling with heavy equipment operations are discussed above.

Because mechanical piling is reducing the amount of woody material within a unit, it can also affect nutrient cycling. Nutrient cycling is discussed in depth below.

Indirect impacts from management activities could include erosion from surface water runoff being channeled into ruts, firelines, and/or along temporary roads within units. Again, these impacts would be minimized by implementing BMPs (Appendix 2) and the following specific management requirements and design criteria.

Approximately 12.25 miles of road are planned to be decommissioned with this project. While roads do not fall under the 15% disturbance standard, reclaiming them can benefit soils. In the short-term, reclamation would improve water infiltration rates, though they may still be lower than undisturbed infiltration rates. Long-term, infiltration rates would continue to improve as soils freeze and thaw, and plant root growth improves soil porosity.

Currently, the beginning of Trail 59 runs along Road 999. The proposal is that Trail 59 would now be accessed through Trail 238. No additional areas of soil disturbance are expected.

Approximately 1.5 miles (< 4 acres) of utility lines are proposed in the Analysis Area. Typically new utility lines are plowed along the shoulder of the road, so no additional soil disturbance is expected. No proposed utility lines would go through proposed timber harvest units. In addition, administrative sites and roads are not considered analysis areas (Page-Dumroese et al 2009). Therefore, disturbance associated with utility lines would not count towards the 15% standard individually or within proposed tmber harvest units.

The proposed boat ramp accessing Koocanusa Reservoir would be expected to disturb approximately one acre. The majority of soil disturbance would result from the creation of a parking lot. The boat ramp and associated development is considered part of the transportation network and therefore does not contribute to the 15% detrimental soil disturbance standard.

Based on this analysis, while some increase in DSD is expected with proposed management activities, all activity areas are expected to remain at/or below the 15% soil quality standard.

FUELS TREATMENTS

Due to the suppression of wildfires over the last century, fuels have accumulated in many areas throughout the Analysis Area. The intent of fuels treatments is to reduce fuel levels and meet vegetation management objectives. Soils Table 3-6 displays the fuels treatment proposed with this project.

Soils Table 3- 6 Types and Amount of Fuels Treatments by Alternative

Activities	Alt 1	Alt 1M	Alt 2	Alt 3
Prescribed burn w/timber harvest	2928	2493	0	2813
Prescribed burn only	2046	2040	0	1719
Prescribed burn w/mechanical	1958	1946	0	1077
Total Fuels Treatments	6932	6479	0	5609

Effects of the No Action Alternative 2 – Fuels Treatments

Alternative 2 does not propose any fuels treatments. Therefore, no direct, indirect, or cumulative effects to soils would result from Alternative 2. It would also not reduce fuel loading in the Analysis Area. As a result, there would be a greater risk of indirect effects caused by high intensity wildfire and greater potential for damaging soil heating (Keane et al 2002). The potential effects include alteration of soil structure, impacts to soil invertebrates, reduced nitrogen, and loss of soluble nutrients (Kuennen 2000). However, past experience with wildfires on Kootenai National Forest indicate that there is a very low risk of these effects even with high intensity fire.

Direct and Indirect Effects of the Action Alternatives – Fuels Treatments

Alternatives 1, 1M, and 3 include underburning with and without timber harvest. Direct effects resulting from underburning can result in soil heating and associated soil impacts such as loss of organic matter, impacts to soil organisms, and creation of water repellency. The potential for these impacts are minimized because the burning prescriptions for this project were designed for low to moderate fire intensity and would be implemented when soil moisture levels are high. Typically, burning is scheduled when the moisture in the lower duff layers is high enough so that the fire does not consume those layers, which insulate the soil from surface heating (DeBano 2000). Burn intensity would not reach the levels associated with nutrient loss through volatilization. Nutrients would be released from burned materials and made available for new vegetation. Although a small portion of the nutrients would be lost through leaching, most of the nutrients would remain attached to or between the soil particles on-site. The re-introduction of fire in the Analysis Area is consistent with the ecological understanding of these forest types (Arno 1996). Positive impacts may result in a short-term (1 to 2 years) increase in plant-available nutrients (Choromanska and Deluca 2001; Hart et al 2005; Certini 2005). Additionally, MacKenzie et al (2006) found that light to moderate fire effects may maintain higher nutrient availability in the long-term with the positive influences from charcoal. Overall, underburning is not expected to detrimentally affect soil productivity in the Analysis Area. This is supported by Forest Soil Productivity Monitoring (refer to the Soil and Water Project File).

NUTRIENT CYCLING

Forest ecosystems have evolved with a continual flux of coarse woody debris (CWD). Coarse woody debris is defined as woody material greater than 3.0 inches in diameter, and is derived from tree limbs, boles, and roots in various stages of decay (Graham et al 1994; Brown et al 2003). CWD performs many physical, chemical, and biological functions in forest ecosystems. Physically, it protects the forest floor and mineral soil from erosion and mechanical disturbances. CWD disrupts airflow and provides shade, which insulates and protects new forest growth. In moist forest types, it can be a seedbed and nursery area for new conifer seedlings. CWD also has significant water holding capacity, making it an important source of moisture for vegetation during dry periods. This decaying woody debris provides nutrients, especially sulfur, phosphorous, and nitrogen, necessary for new plant growth. CWD also hosts ectomycorrhizae, micro-organisms that play an important role in the uptake of nutrients and water by woody plants (Graham et al 1994).

The importance of soil organic matter (duff layer) is indispensable to productivity and the ecological function of soils (Brady and Weil 2002). This organic component contains a large reserve of nutrients and carbon, and typically contains the majority of microbial activity within the soil column. Forest soil organic matter influences many critical ecosystem processes such as the formation of soil structure, which in turn influences soil water infiltration rates and soil water holding capacity. Soil organic matter is also the primary location of nutrient recycling and humus formation, which enhances soil cation exchange and overall fertility.

Effects of the No Action Alternative 2 – Nutrient Cycling

Alternative 2 does not propose any new management activities. Therefore, no direct, indirect, or cumulative effects to nutrient cycling would result from Alternative 2. Nutrient cycling would continue at present rates until a natural disturbance occurs.

Direct and Indirect Effects of the Action Alternatives – Nutrient Cycling

A direct impact from management activities in Alternatives 1, 1M, and 3 would be the removal of woody material from proposed timber harvest units. The removal of all or most of the organic material (both duff layers and CWD) from a site can cause temporary nutrient deficits that may affect physical and biological soil conditions (Brady and Weil 2002; Graham et al 1994; Brown et al 2003). To avoid this, it is important to maintain both fine and CWD on managed sites, especially regeneration harvest units where most of the organic matter is removed (Graham et al 1994; Brown et al 2003). Allowing the accumulation and decomposition of a range of sizes of woody debris maintains both short-term and long-term soil productivity. The different decomposition rates provide for the slow, continual release of nutrients.

This project was designed to provide for a continuous supply of woody material based on recommendations from Graham et al (1994) and Brown et al (2003). In harvest stands, where more of the overstory is being removed, each activity area has been assigned a habitat-specific retention level for CWD (Soils Table 3-7). In underburn with mechanical treatment and commercial thin harvest units, post-harvest stands would remain fully stocked, which would provide for yearly nutrient inputs through litter fall (Brady and Weil 2002) and long-term CWD as a result of future blow-down and decadence. Therefore, these units need less CWD left on the ground post-activity (Soils Table 3-7).

Soils Table 3- 7 Recommended Levels of CWD (>3” diameter)

Tons Acre	VRU(s)	Forest Type	Unit(s)
5 to 20	1 - 3	Warm Dry	1, 2, 3, 5, 6, 10, 12, 13, 14, 15, 16, 19, 21, 24, 47, 52, 53, 54, 103, 110, 111, 112, 116, 120, 201, 203, 211, 212, 220, 223, 325
10 to 30	4 - 11	Warm Moist / Cool Moist	17, 23, 25, 26, 28, 29, 30, 36, 38, 40, 49, 50, 51, 118, 129, 138, 221, 222, 225

Coarse wood provides micro-sites for microbial activity, retains carbon on-site, and moderates soil moisture (Graham et al 1994; Brown et al 2003). Alternatives 1, 1M, and 3 propose the removal of vegetation through timber harvest and burning. Soil productivity would be maintained through retention of CWD at levels recommended in Graham et al (1994) and Brown et al (2003). Maintaining CWD at the levels identified in these guidelines would ensure that both short-term and long-term soil productivity is maintained. Therefore, implementation of either of the action alternatives is not expected to adversely impact nutrient cycling in the Analysis Area.

CUMULATIVE EFFECTS

Cumulative effects are the result of all the impacts that past, current, and reasonably foreseeable activities have on a resource. A summary of activities are listed in Tables 3-1 and 3-2 (III-2 through III-4) in Chapter III. More specific information can be found in Appendix 5. The results of past activities have resulted in the “Existing Condition” described above. The anticipated effects from proposed activities were then added to the existing condition and described in the section titled “Direct and Indirect Effects.” The sum of the existing condition (including past actions) and the direct and indirect effects of proposed actions combined with current and reasonably foreseeable actions result in the cumulative effects described in this section.

The Analysis Areas for consideration of cumulative effects consist of the same activity areas analyzed used in existing condition, direct, and indirect effects. This is appropriate because soil productivity is spatially static and productivity in one location does not affect productivity in another location. The activity areas are delineated as directed by Forest Service Manual R-1 Supplement No. 2500-99-1.

Based on soil monitoring and literature research, all laws, regulations, and policies with regard to soils would be protected under the implementation of any of the alternatives. Below is the rationale for this conclusion.

CURRENT VERSUS HISTORIC MANAGEMENT PRACTICES

There are marked differences between past and current land management practices and policies. The evolution that has taken place with regard to land management practices is the result of science, technology, ongoing monitoring actions, and changing public values. The earliest harvest methods involved harvesting the biggest, most valuable trees and leaving the other trees on-site. Harvest methods in the 1950s, 1960s, and 1970s focused primarily on providing low-cost wood products. Logging systems were selected primarily by the least expensive method to transport trees from the forest to the mill. Tractor skidding was typically used and trails and landings were not minimized. Harvest on steeper slopes, at times, involved stair-step excavated trails (i.e. jammer roads). In addition to harvest activities, fuels reduction and site preparation for natural regeneration or planting many times consisted of dozer piling. Many of these practices led to excess soil disturbance and increased the risk of erosion

Over the last twenty years, impacts to soil and water resources from logging activities have been reduced because of Best Management Practices (BMPs), the Inland Native Fish Strategy (INFS), and changes in science, technology, etc. Based on research studies, current BMPs and INFS riparian habitat conservation areas (RHCAs) can reduce sediment delivery to streams compared with historical practices (USDA Forest Service 1995). Harvest methods and removal of timber products from the national forest changed substantially over time. Modern timber harvest prescriptions and design emphasize desired conditions of the forest after timber harvest. This often results in the retention of various amounts of trees in a post-harvest stand to address objectives that may include seed production, shelter for the site, watershed objectives, soil productivity, wildlife, and others. Elements of modern harvest prescriptions that address specific resource concerns include retention of snags and down wood for soil nutrition, minimizing the number of skid trails, and maintaining sediment filtering vegetation in riparian areas near lakes and streams. Jammer roads and dozer piling rarely occur. Forest BMPs currently incorporated into timber harvest activities include (refer to the BMP document in the Soil and Water Project File):

- Maintaining water quality and soil productivity, and reducing erosion and sedimentation through timber harvest unit design. Some examples include avoiding sensitive areas, delineating RHCAs, etc.
- Limiting the operation period of timber sale activities to dry, frozen, or snow covered conditions to minimize soil erosion, sedimentation, and soil productivity.
- Determining the proper log retrieval system for the timber harvest unit slope to protect from degradation of water quality or soil productivity. Tractor skidding is typically on ground less than 40% slope. Skyline and other cable yarding systems are used on steeper slopes.
- Controlling erosion during and after harvest activities to protect water quality and soil productivity. Some examples include ripping and/or water barring skid trails and landings, seeding and fertilizing, spraying for weeds, etc.

BMP implementation and effectiveness have been monitored and documented on the Kootenai National Forest. Refer to Consistency with Regulatory Framework for a more in-depth discussion of BMP monitoring.

In 1995, the Forest Plan was amended to include INFS management direction (USDA Forest Service 1995). The implementation of INFS gave greater protection to soil and water resources in riparian areas adjacent to streams, lakes, and wetlands. INFS gives riparian dependant resources priority over other resources in RHCAs. RHCAs are not “lock out” zones, activities that occur in them either benefit the riparian area and associated aquatic features or, at a minimum, not slow the rate of recovery within the riparian area.

CURRENT AND REASONABLY FORESEEABLE ACTIONS

In the following discussion, the effects of past, current, and/or reasonably foreseeable activities are considered cumulatively with activities proposed with this project. The effects were either described as not contributing effects, contributing indiscernible effects, or having a measurable effect on water resources.

Vegetation Management and Fuels Reduction Activities

There are no current or reasonably foreseeable Forest Service commercial timber sale projects planned within the Analysis Area. Therefore, no additional effects would be contributed from these activities.

It is expected that there would be salvage of blown-down trees within the Analysis Area. Treatment acres are not expected to exceed 20 acres per year over the next 10 years. If treatment is required the appropriate analysis would be conducted at that time. If harvest occurs, soil disturbance would be limited to existing trails, roads, and fire lines. Therefore, no additional detrimental soil disturbance is expected within the activity areas. Some of the salvage is likely to occur outside of the units treated under the selected alternative; therefore, any such impacts would not be additive activity areas analyzed in this decision.

Precommercial thinning is an ongoing and reasonably foreseeable activity. It is expected that 2254 acres would be thinned within the Analysis Area over the next ten years. Ongoing and reasonably foreseeable pre-commercial thinning activities within the Analysis Area would contribute indiscernible effects to soils within the Analysis Area. This is because pre-commercial thinning is done by hand and there is no additional ground disturbance. In addition, trees removed during thinning projects are left on-site.

Approximately 93 acres of Dodge Mountain Pine Beetle Unit 1 overlap with the Young Dodge Project Area. The unit was proposed in the 2011 Commercial Thinning Project. The project proposes removing primarily pole-size trees <10 DBH followed by either hand or excavator piling in order to reduce the susceptibility of mountain pine beetle attack. A secondary objective is to reduce ladder fuels, thereby lessening the chance of a crown fire (these stands are in the WUI). Activities associated with Dodge Mountain Pine Beetle Unit 1 would not overlap with any of the activity areas proposed in Young Dodge. Therefore, there would be not cumulative effects associated with Young Dodge Units because soil productivity effects are spatially static and productivity in one location does not affect productivity in another location.

Christmas trees/boughs can be harvested for individual use or commercially on National Forest land. Each of these activities requires a permit. These activities are both current and reasonably foreseeable within the Analysis Area over the next ten years (approximately 200 acres). This activity does not create additional ground disturbance or remove enough vegetation to affect soil productivity and therefore would not contribute additional effects to soil resources.

Cattle Grazing

The Analysis Area provides range for one grazing allotment: West Kootenai. The Analysis Area encompasses the most of the West Kootenai Allotment and the remainder of the allotment is in the Gold Boulder Sullivan Planning Area. The West Kootenai and Boulder/Scalp Mountain Grazing EA and Decision Notice, which follows Forest Plan direction, provide direction for the management of this allotment. The effects of livestock grazing on soils are constantly being evaluated as part of the allotment management plan. In the recent past, the trend within the allotment for cattle-induced soil compaction and erosion was stable. In both upland and wetland areas, compaction due to grazing is discontinuous and localized. It is lightest in areas with heavy timber and alder or willow cover. Compaction is heaviest in areas that are easily accessible, have high summer soil moisture content, and have concentrated or season-long use. Compacted soils comprise less than two percent of the total allotment area.

Because of topography and vegetation, existing riparian impacts associated with cattle grazing are localized. Steepened slopes, deadfall, and dense stands of trees surround most streams, allowing cattle only sporadic access to riparian areas. Most all of the wetlands and ponds within the Analysis Area are not easily accessed by cattle.

Only livestock grazing was determined to contribute to cumulative effects. Livestock grazing and associated activities are expected to continue in the Analysis Area through the operating period of 10 years. Currently 225 cow/calf pairs are permitted to graze on the West Kootenai allotment from approximately May 15 to September 30. Actual use for the past several years has averaged around 180 pairs. Cattle tend to use existing skid trails and are not expected to increase soil compaction in activity areas by more than two percent (Kuennen 2003). Due to additional soil disturbance from grazing, proposed regeneration harvest Units 2, 12, 21, 112, 201, 211, 212, and 220 (Soils Table 3-4) have the potential to be above the 15% standard when analyzed cumulatively. To meet Regional Standards, the skid trails within these units would be ripped and/or recontoured and covered with slash and CWD (refer to the Management Requirements and Design Criteria, II-20). The units will be monitored after skid trail restoration is complete to make sure that they are meeting the 15% standard. As a result, grazing in combination with the effects of prior management and the proposed activities is not expected to exceed the threshold of 15 percent for detrimental soil disturbance in any activity area (refer to the document Soil Recovery and Restoration in the Soil and Water Project File).

Noxious Weed Treatments

The control of noxious weeds on National Forest land is an ongoing activity that normally occurs within the summer months. The 2007 Kootenai National Forest Invasive Plant Management ROD provides direction for noxious weed control on the District. Noxious weed control is expected to continue over the next ten years.

Effects of noxious weed control were incorporated into the cumulative effects analysis through consideration of the effects disclosed in the Herbicide Weed Control EA, a review of the project database, and professional judgment and personal knowledge of noxious weed control. The findings of this assessment conclude that ongoing and reasonably foreseeable noxious weed control within the Analysis Area would cumulatively contribute indiscernible effects to the soils resource. The level of noxious weed control within the Analysis Area is not expected to increase much over the next ten years. All activities will follow approved application methods as analyzed in the Kootenai National Forest Invasive Plant Management ROD (2007); therefore no adverse cumulative effects would occur.

Fire Suppression

Fire suppression activities would occur as needed. Effects from wildfire suppression would vary with location and size of the fire; however suppression activities are expected to follow Forest Plan direction. Suppression of wildfires could have measurable effects to soils within the Analysis Area. These effects could include soil compaction, displacement, and erosion. Due to the unpredictable nature of wildfires, including their location, cumulative effects from future wildfire suppression activities could not be meaningfully quantified in this document.

Road Management

Routine road maintenance would occur as needed on roads in the Analysis Area; separate from any road maintenance identified in this FSEIS. Routine road maintenance will occur as needed on Roads 303, 470, 7202, 7205, and 7220 in the Project Area, separate from any road maintenance identified in this document. Maintenance includes road blading, gate repair/replacement, cleaning ditches and culverts, installing culverts, replacing culverts with larger diameter culverts, installing drain dips and surface water deflectors, placing riprap to armor drainage structures, placement of aggregate, brushing, and debris removal.

Road management is outside of the activity areas identified for soils analysis because the permanent road system and administrative sites to do not count toward the 15% soil quality standard. In addition, these areas are already disturbed and no additional road construction is proposed. Therefore, road management would have no cumulative effect on soils in the analysis areas because soil productivity effects are spatially static and productivity in one location does not affect productivity in another location.

Recreation Maintenance

Routine maintenance will occur on approximately 10 miles of non-motorized trails in the Project Area. Maintenance may include brushing; removing blowdown, debris, and hazard trees; repairing or adding waterbars; repairing treads; repairing or replacing signs; and improving vistas. Routine trail maintenance would have no effect on soils in the activity areas identified. Administrative sites and trails do not count toward the 15% standard. In addition, the trails are individually small, scattered across many watersheds, and not all work would occur in the same year.

Special Uses

Two outfitter/guides are active during the big-game hunting season on the District, and may be active in the Project Area. This activity would have no effect on soils activities areas within the Analysis Area. This conclusion is based on the limited amount of activity and the location of the activity that is mainly on existing trails and disturbed areas. Other special use permits include road access to private property, water lines, a gravel pit, Montana Fish, Wildlife, and Parks fish weir, and the West Kootenai Fire Station. These special uses would not occur within any of the activity areas identified in this project. Therefore, these activities would not add detrimental disturbance to the amounts listed in Soils Table 3-5. The level of special uses within the Analysis Area is not expected to change much over the next ten years.

Public Uses

Recreational use of the Project Area is expected to include hiking, camping, fishing, hunting, photography, small forest product gathering (berries, mushrooms, cones, and boughs), Christmas tree cutting, firewood gathering, driving for pleasure, mountain biking, sightseeing, wildlife viewing, cross-country skiing, snowshoeing, trapping, and snowmobiling. These activities are expected to continue over the next ten years. Because of increasing numbers of people moving into the local communities, it is expected that some of these activity levels would increase. Recreational activities would contribute indiscernible effects to soils. This conclusion is based on the fact that these activities are individually small and scattered across many watersheds.

Off-highway vehicle (OHV) use was left off the list above because it is currently limited only to existing trails and open roads (OHV Record of Decision and Plan Amendment for Montana, North Dakota, and Portions of South Dakota, 2001). Therefore, no additional disturbance is expected from OHV use because soil productivity effects are spatially static and productivity in one location does not affect productivity in another location.

Private Property

Activities on private lands would have no effect on soils in the Project Area because soil productivity effects are spatially static and productivity in one location does not affect productivity in another location.

State Land Activities

Activities on state and provincial lands would have no effect on soils in the Project Area because soil productivity effects are spatially static and productivity in one location does not affect productivity in another location.

CONSISTENCY WITH REGULATORY FRAMEWORK

STATE AND FEDERAL LAWS AND REGULATIONS

The National Forest Management Act (NFMA) requires that all lands be managed to ensure maintenance of long-term soil productivity, hydrologic function, and ecosystem health. All activities proposed are consistent with this direction. Having a fully stocked stand left on-site to contribute needle-cast and/or trending toward the CWD guidelines contained in Graham et al (1994) and Brown et al (2003) would assure long-term soil productivity. All activity areas would remain below 15 percent detrimentally disturbed soils, RHCAs would be delineated where appropriate, design criteria would be followed, and all applicable BMPs would be implemented.

FOREST PLAN DIRECTION

The Forest Plan states that project plans for activities requiring the use of ground-based equipment will establish standards for the area allocated to skid trails, landings, temporary roads, or similar areas of concentrated equipment use (USDA Forest Service 1987a). Forest Service Manual 2500-99-1 establishes guidelines that limit detrimental soil disturbance to no more than 15 percent of an activity area. Forest Plan soil productivity monitoring results were reviewed throughout this project (Kuennen 2007; Kuennen 2003; USDA Forest Service 2003; and USDA Forest Service 1998). The five-year results from 1992–1997 found less than one percent of the acres surveyed were above the 15 percent threshold, with 77 percent of surveyed areas having less than 10 percent detrimental disturbance. From 1998–2005, none of the areas surveyed were above the threshold.

Kuennen (2003 and 2007) compiled all monitoring data to date, which was used as the basis for soils analysis and specifying design criteria for this project. All proposed activities are expected to remain below the 15 percent threshold. All management activities would follow the BMPs outlined in Soil and Water Project File and would be consistent with Forest Plan Standards. The 2011 KNF Monitoring Summary (USDA Forest Service 2011) states that monitoring between 1991 and 2011 shows that 95 percent of the BMPs implemented during that time were effective.

The proposed project is consistent with the goals, objectives, and standards for soil and water resources set forth in the Kootenai Forest Plan because project design criteria and BMPs have been included to protect soil and water resources. The BMPs include Soil and Water Conservation Practices at a minimum to control non-point source pollution and protect soil and water resources from permanent damage. All proposed treatment units were field reviewed. None of the harvest units would exceed the Regional Soil Quality Standards for detrimentally disturbed soils.

VEGETATION AND DISTURBANCE PROCESSES

INTRODUCTION

The forests in the Young Dodge area are composed of a variety of vegetation. This vegetation occurs in diverse combinations and patterns of species, ages, sizes, shapes, and structure. These diverse forests provide a multitude of social, biological and ecological benefits, such as wildlife habitat, livestock forage, timber products, firewood, berries, clean air and water, and a pleasant setting for human enjoyment. Disturbance processes play a major role in shaping forest vegetative conditions. In the Young Dodge Decision Area, fire is the major disturbance process that has shaped vegetative patterns and diversity.

Forests in the northern Rockies have developed in close relationship with wildfire. Many of the plants and animals found here rely on fire to change the structure, composition, and pattern of vegetation. Fire provides for regeneration of tree species such as lodgepole pine, creation of forest openings, and the recycling of nutrients to the soil. The size and intensity of the fires, and the ensuing vegetative patterns, are determined by a combination of soils, topography, stand structure, and climate (Johnson et al 1994 35-36). The suppression of wildfires during the past 90 years has had a strong influence on these fire-dependent ecosystems. The natural fire regimes are altered by control of low-to-moderate intensity fires and by creation of an environment conducive to high-intensity stand-replacement fire.

Forest insects and disease have also played a role in shaping vegetative patterns and diversity. When occurring at endemic levels, insects and disease can increase diversity and create important structural attributes such as snags and coarse woody debris for wildlife habitat, and openings in the canopy that allow regeneration of seral species and increase in browse species. When insects or disease increase above endemic levels, they can create heavy accumulations of fuels and increase fire hazard, provide breeding sites that serve to further increase insect populations and eventually cause tree mortality. Under natural conditions, insects and disease help set the stage for wildfires to renew forest vegetation.

REFERENCE CONDITIONS

This analysis identifies specific disturbance processes that, together with landform and other environmental elements, have influenced the patterns of vegetation across the Decision Area. Vegetative Response Units (VRUs) were used to define and describe the components of ecosystems. VRUs are used to describe an aggregation of land having similar capabilities and potentials for management. These ecological units have similar properties in natural communities: soils, hydrologic function, landform and topography, lithology, climate, air quality, and natural processes (nutrient and biomass cycling, succession, productivity, and fire regimes).

In addition to VRUs, this analysis divides the vegetation by Forest Type. Each Forest Type has a characteristic frequency and type of disturbance based on its climate, soils, vegetation, animals and other factors (Oliver and Larson 1999). Populations of native plants and animals have responded and adapted to these characteristic disturbance regimes and the resulting vegetation patterns and structure. These characteristic processes, patterns and structure are termed “Reference Conditions.”

Following are summaries of the reference conditions for the VRUs found in the Decision Area.

VRUs 1, 2, and 3 (Dry Forest) - The Dry Forest types occur mainly on the lower elevations and consisted of a mixture of ponderosa pine, Douglas-fir, western larch, and lodgepole pine. The species mix and stand density vary with aspect.

Typically, the southern aspects were predominantly ponderosa pine, with lesser amounts of Douglas-fir, western larch, and lodgepole pine. Some of the areas were characterized by open, park-like stands of ponderosa pine and Douglas-fir, with grass and brush understories. The conditions were maintained by low and moderate-severity fires that typically occurred every 15-30 years. These fires removed smaller Douglas-fir trees and favored the more fire-resistant ponderosa pine. When these low-intensity fires burned into small areas with heavier fuel accumulations or high densities of understory trees, they burned with more intensity, sometimes killing small patches of overstory trees. These are referred to as "mixed-severity fires." Stand-replacement fires were infrequent, occurring every 150-200 years or longer. Stand-replacing fires occur when a combination of high fuel loads, hot, dry, and windy weather and an ignition source occur at one location.

Patches are areas of uniform vegetation that differ in structure and composition from that which surrounds them. Patch size was somewhat larger on north aspects and moister sites, than on drier southern aspects. Naturally-occurring patch sizes are generally larger than those created by past timber harvest due to National Forest Management Act (NFMA) administrative limits on opening size. Triepke (2001) found that in the dry forest type the average historic patch size was 481 acres, with 12 percent of the patches between 100 and 300 acres, only three percent were less than 100 acres.

On north and east aspects at the lower elevations, Douglas-fir and western larch dominated the stands, along with ponderosa pine. Some stands had a significant component of lodgepole pine. Low-intensity underburns and mixed-severity fires occurred at much the same frequency as on south exposures, however, due to higher moisture levels on north slopes, underburns were less extensive and stand densities were higher. Stand-replacement fires were more common on north aspects due to increased fuel accumulations and understory densities. In many cases these stand-replacing fires would burn the entire north aspect, changing to an underburn or mixed severity fire when they spread into lower fuel conditions or other aspects.

On all aspects there were areas where understories developed into thickets of dense Douglas-fir. Mixed-severity fires created mosaics uneven age stands and even-aged stands with individual and groups of surviving trees. This provided structural and habitat diversity within stands, and created conditions that were necessary for stands to regenerate.

Root disease (*Armillaria ostoyae*) and the Douglas-fir beetle were the major forest health factors. Root disease mortality occurred in small, discontinuous pockets, affecting mostly Douglas-fir. This discontinuous distribution of root disease was due to a combination of the relatively wide spacing resulting from repeated low-intensity burns, and from a moderate-to-heavy component of western larch and ponderosa pine, which are relatively resistant to root disease. Mortality resulting from Douglas-fir beetle attack was generally scattered, affecting mostly the older, decadent Douglas-fir. Occasionally, high levels of mortality may have occurred in denser stands that had a high component of mature Douglas-fir. Brown cubical root and butt rot (*Polyporous schweinitizii)* was scattered throughout the Dry Forest, acting mostly as a butt rot and weak root pathogen that rarely caused direct mortality, but often lessened the vigor of older Douglas-fir, predisposing them to a bark beetle attack that eventually killed the tree.

VRUs 5 and 7 (Moist Forest) - The Moist Forest type occurred in lower, moist subalpine areas and consisted mostly of various mixtures of western larch, lodgepole pine, Douglas-fir, subalpine fir, and Engelmann spruce, with western white pine, western red cedar, and western hemlock also occurring in a few areas. Stand densities range from park-like to densely stocked. The characteristic disturbance regime of these forest types is a mixed-severity fire every 40-90 years followed by stand-replacing fires every 100-200 years. Mixed-severity fires often maintained open stands of western larch for 200 or more years (USDA Forest Service 1998). Stand-replacing fires were a result of heavy fuel buildups that occurred from a mixture of normal tree mortality and disturbance-caused mortality (e.g. past fires, windthrow, insects, and disease). The fire pattern resulted in heavy tree mortality and the development of large, mostly even-age stands. Both single and two-storied stands developed, with the upper story in two-storied stands consisting of scattered, large diameter western larch and Douglas-fir that survived the fire. Patch sizes ranged from 50 to 5000 acres or larger, with most in the 1000-2000 acre size class (Gautreaux 1999). Naturally-occurring patch sizes are generally larger than those created by past timber harvest due to administrative (NFMA) limits on opening size. Triepke (2001) found that in the moist forest type the average historic patch size was 632 acres, with eight percent of the patches between 100 and 300 acres. Only two percent were less than 100 acres.

Infrequent but extensive stand-replacing fire is the primary ecological process that drives patch size in the moist and cold VRUs. Mixed-severity fires are the primary process that developed the reference stand structure, particularly the structure of old growth stands dominated by western larch (USDA 1998).

Root disease occurrence and distribution in the Moist Forest type was dependent on the occurrence of susceptible species such as Douglas-fir and subalpine fir. If these species did not compose a significant component of the site for a generation or two, then root disease would occur only in isolated pockets. If these species were a major component for one or two generations, then large root disease centers would develop and in some cases the root disease colonies would merge. In the Decision Area, root disease levels in the Moist Forest type appear to be low, indicating that these sites have been largely dominated by the more root disease-resistant species such as western larch, western white pine, and Engelmann spruce. Brown cubical root and butt rot were scattered throughout the Moist Forest type, weakening trees, but rarely causing direct mortality. These pathogens often lessen the vigor of older Douglas-fir, predisposing them to bark-beetle attack.

A number of bark beetles played important roles in the Moist Forest type. Mountain pine beetle (*Dendroctonus ponderosae*), spruce beetle (*Dendroctonus rufipennis*), and western balsam bark beetle (*Dryocetes confusus*) were the most impactive over the Rexford Ranger District. Mountain pine beetles were the most aggressive of these, with periodic epidemics killing most of the lodgepole pine (8-inches diameter at breast height and larger or over 70-years old) in affected areas. Outbreaks of spruce beetle would cause moderate-to-high mortality in stands heavily stocked with larger-diameter Engelmann spruce. These outbreaks were often precipitated by windthrow, which allowed the beetle population to increase in the downed trees. Western balsam bark beetles were the major cause of mortality in subalpine fir, with infestations developing in trees weakened by drought, heavy tree competition or disease. Periodic outbreaks of all three bark beetles have occurred in the Young Dodge area.

VRUs 9 and 10 (Cold Forest) - The Cold Forest type occurred in the dry, cold, upper-elevations, and consisted mostly of various mixes of lodgepole pine, subalpine fir, and Engelmann spruce. Western larch and Douglas-fir were a minor component in some stands. Whitebark pine and subalpine larch occur at elevations above 6200 feet. At these higher elevations, areas of lighter and more open stocking occurred on rocky ridges. Mixed-severity fire was typical in these high-elevation stands with seral whitebark pine and subalpine larch as significant components. Non-lethal underburns occurred at intervals of 50-70 years (Gautreaux 1999). Below 6200 feet, stands were usually moderate-to-heavily stocked. Open forest conditions were uncommon due to the lack of frequent surface fires. The cool, dry conditions in this forest type favored stand-replacement fires at long return intervals of 120-200 years. These large-scale crown fires were a result of heavy fuel buildups that occurred from a mixture of normal tree mortality and disturbance-caused mortality (e.g. past fires, windthrow, insects, and disease). The fire pattern resulted in heavy tree mortality and the development of large, mostly even-age stands, usually single-storied, but occasionally some larger-diameter western larch or Douglas-fir survived the fire and formed the upper story of a two-storied stand. Patch size ranged from 100 to 5000 acres or larger, with most in the 1000-2000 acre size class (Gautreaux 1999). Naturally-occurring patch sizes are generally larger than those created by past timber harvest due to administrative (NFMA) limits on opening size. Triepke (2001) found that in the cold forest type, dominated by lodgepole pine, the average historic patch size was 1255 acres, with three percent of the patches between 100 and 300 acres. Less than one percent was less than 100 acres.

EXISTING CONDITIONS AND TRENDS

The existing condition for the Vegetation Resource in the Decision Area is the result of disturbances that have occurred through time, primarily wildfire, insect and disease infestation, timber harvest, and fire suppression. Fire atlas records for the KNF for the period 1908-2005 show 108 lightning-caused and 54 person-caused fires were suppressed in or near the Decision Area. During this 97-year period, the KNF experienced numerous extreme fire seasons: 1910, 1940, 1958, 1961, 1967, 1970, 1973, 1979, 1984, 1985, 1988, 1991, 1994, and 2000. There is a high probability that, had suppression not occurred during these years, wildfires would have burned through significant areas of the landscape as stand-replacement or understory/low-intensity ground fires. Aggressive fire suppression will continue in the Decision Area in accordance with national, regional, and Forest Plan direction.

Exclusion of ground fires during the last 90 years has allowed accumulations of dead and down fuels and vigorous undergrowth of small tree thickets, which now provide ladder fuels that could accelerate initiation of major crown fires in forest stands (Omi and Pollet 2002). The mountain pine beetle epidemic in the late 1980s and early 1990s contributed significantly to these conditions by killing 30-60+% of the lodgepole pine in many stands, resulting in extremely high ground fuel loads.

Exclusion of ground fires has also resulted in a decrease of early seral, fire-resistant tree species such as ponderosa pine, western larch, whitebark pine, and subalpine larch and caused an increased amount of shade-tolerant trees. Shade tolerant trees are typically fire-intolerant, and highly susceptible to insects and disease (USDA Forest Service 2003a; USDA Forest Service 2003b). The *Northern Region Overview* specifically identified that a reduction in the “western larch cover type and emergent structure (was) due to the lack of low-intensity, periodic disturbance, and a shift toward stand-replacing fire, with associated loss of wildlife habitat for some species.” Much of this cover type that still exists is “at risk” for loss by stand-replacing fire (USDA Forest Service 1998b). Additionally, the *Analysis of the Management Situation for the Revision of the Kootenai and Idaho Panhandle Forest Plans* states that strategies need to be developed to restore wildlife habitat provided by the western larch cover type (USDA Forest Service 2003a).

Western white pine blister rust, a non-native fungal disease, has greatly reduced the amount of western white pine in the Decision Area. Western white pine is an early seral species, moderately fire-tolerant, but extremely resistant to root disease. The mountain pine beetle infestation has also reduced the amount of whitebark pine in the Decision Area.

High stocking densities occur in a number of stands in the Decision Area (Lewicki 2006). High stocking densities cause excessive inter-tree competition, which results in stress-related mortality, which in turn increases fuel loads and the risk for stand-replacing fire. In addition, crown fires occurring in densely stocked stands spread faster than crown fires occurring in less dense stands (Graham et al 1999; Scott and Reinhardt 2001; and Pollet and Omi 2002 1-10).

Field reconnaissance during the development of the Proposed Action indicated that root disease in the Decision Area was at endemic levels, consisting of scattered, small pockets of root disease. However, in the Dry Forest type, a lack of ground fire and an increase in the occurrence and density of Douglas-fir could result in conditions favorable to an increased occurrence of root disease (Hagle et al 1991).

Recent management within the Decision Area has interspersed the forest with a series of 20-40 acre openings with very distinct edges between harvested and unharvested areas. This disturbance regime provides suitable habitat for species that are adapted to the edges between forested and nonforested areas. However, species that require larger blocks of habitat are at a disadvantage under such a disturbance regime. Hillis and others in 1991 determined that the minimum patch size needed to provide effective security for elk is 250 acres. In 1997, Crow and Gustafson found that harvesting 1 percent of the forest each decade using small openings resulted in less forest interior than harvesting 7 percent of the forest each decade using larger openings. They found that forest interior declines sharply with reductions in cutting-unit size below approximately 50 acres (Crow and Gustafson 1997). Since 1980, 221 units in the Decision Area ranging from 0.7 to 197 acres have been harvested using a regeneration prescription. Of these 221 units, 210 are less than 50 acres. The average size of all of the regeneration units in the Decision Area is 22 acres. Most of these units are surrounded by stands with moderate-to-high fuel levels.

EXISTING CONDITION AND TREND BY VRU

VRUs 1, 2, and 3 (Dry Forest) - Existing conditions differ from the reference conditions in five ways and present forest protection or forest health concerns because they are developing into conditions that could lead to large, stand-replacing wildfires. These conditions are as follows:

1. A buildup of ground fuels has occurred over most of the Dry Forest types due to a combination of normal mortality and the lack of frequent underburns. Fuel levels are higher over a greater area than would be expected had the natural fire cycle been allowed to continue. These fuel accumulations are increasing the risk of stand-replacing wildfire.

2. Effective fire suppression and few natural underburns have changed the species composition and stand structure in portions of the Dry Forest types. The stand structure has changed from an open, park-like stand of large ponderosa pine and western larch to a two or three-story stand composed of a large, widely scattered overstory, with a very dense understory of smaller Douglas-fir. These high-density understories provide ladder fuels that increase the potential for wildfires to develop into stand-replacing crown fires rather than the low-intensity underburns that historically occurred on these sites. As overstory trees gradually die, the sites they occupy are being taken over by thickets of Douglas-fir. Large trees are unlikely to develop due to overstocked stand conditions. The dense understory competes with the larger overstory trees for nutrients and moisture. The competition stresses these larger, older trees, and predisposes them to insect and disease attack. These developing stands are significantly different from reference conditions where well-spaced, large-diameter overstory trees dominated these sites that were sustained through frequent low-intensity fires.

3. High stocking density of some stands is causing excessive inter-tree competition that result in stress-related mortality, which in turn increases both ground and aerial fuel loads and the risk for stand-replacing fire (Graham et al 1999; Scott and Reinhardt 2001; and Pollet and Omi 2002). This high stocking density is due in part to a lack of low intensity, periodic disturbance.

4. High densities of mature Douglas-fir trees predispose stands to high levels of beetle attack. A number of areas have experienced moderate-to-heavy Douglas-fir beetle mortality during the last ten years. Existing high densities of mature Douglas-fir trees and increasing populations of bark beetles put a number of stands in the Decision Area at moderate-to-high risk of beetle attack. Bark beetle mortality is adding to fuels accumulations and contributes to the fuels hazard.

5. Forest Service policy and NFMA direction that limits opening size to 40 acres has resulted in a fragmented landscape with scattered openings much smaller than reference condition patch size (see discussion in VRUs 5, 7, 9, and 10).

VRUs 5, 7, 9, and 10 (Moist And Cold Forests) - Four existing conditions in the Moist and Cold Forest types present forest protection or forest health concerns. As with the Dry Forest types, these existing conditions may differ from those found in the reference condition, and present forest health concerns because they develop conditions that could lead to large, stand-replacing wildfires.

1. A buildup of ground and ladder fuels has occurred over most of the Moist Forest type, due to a combination of normal mortality, disturbance-induced mortality (e.g. windthrow, bark beetles, and root disease), and the lack of low-intensity fires. In a number of areas this buildup could result in a large-scale stand-replacement fire if a fire start were to occur. Although large stand-replacement fires have historically occurred in these forest types, they are undesirable for a number of reasons: they destroy merchantable wood products, and may result in significant impacts to soils, aquatic resources, air quality, old growth, and other wildlife habitat. The mountain pine beetle epidemic in the late 1980s and early 1990s contributed significantly to these conditions by killing 30-60+% of the lodgepole pine in many stands, resulting in extremely high ground-fuel loads.

   Fire suppression and exclusion, combined with naturally-occurring cycles, have resulted in a shift from mixed-severity fires toward stand-replacing fires. Mixed-severity fires developed and maintained an "emergent" stand structure where the overstory was dominated by large-diameter seral species, particularly western larch (USDA Forest Service 1998b). Much of this emergent structure still exists in the Decision Area. However, this forest type, particularly the western larch type, is at risk for these reasons: (a) a lack of mixed-severity fires has resulted in a multi-layered structure with the understory composed of shade-tolerant species. These species compete with the large, old overstory trees for moisture, nutrients, and crown space, lessening the vigor of the overstory trees; (b) these shade-tolerant understory trees typically have full crowns that reach the ground. These full crowns serve as "ladder" fuels, which enable ground fires to reach the crowns of the overstory trees. Fires that would normally be light ground fires or moderate, mixed-severity fires become stand-replacing fires that kill even the largest overstory trees. The *Northern Region Overview* specifically identified that a reduction in the "western larch cover type and emergent structure (was) due to the lack of low intensity, periodic disturbance, and a shift toward stand-replacing fire, with associated loss of wildlife habitat for some species." Additionally, the *Analysis of the Management Situation for the Revision of the Kootenai and Idaho Panhandle Forest Plans* states that strategies need to be developed to restore wildlife habitat provided by the western larch cover type (USDA Forest Service 2003a).

   Exclusion of ground fires has also resulted in a decrease of early-seral, fire-resistant tree species such as ponderosa pine, western larch, subalpine larch and whitebark pine, and an increased amount of shade-tolerant, fire-intolerant, and insect and disease-prone trees (USDA Forest Service 2003a). Many stands had a component of lodgepole pine that was killed in the mountain pine beetle epidemic in the early 1990s. This lodgepole pine mortality developed high fuel loads conducive to stand-replacing fires (USDA Forest Service 1998b).

   White pine blister rust, a non-native fungal disease, has greatly reduced the amount of western white pine in the Decision Area. Western white pine is an early-seral species, moderately fire-tolerant, but extremely resistant to root disease. Mountain pine beetle infestation has also reduced the amount of whitebark pine in the Decision Area.

2. High stocking density of some stands is causing excessive inter-tree competition, which results in stress-related mortality. This high stocking density is due in part to lack of low-intensity, periodic disturbance. This increases fuel loads and the risk for stand-replacing fire (Graham et al 1999; Scott and Reinhardt 2001; and Pollet and Omi 2002).

   High tree densities predispose stands to high levels of bark beetle attack and a number of areas have experienced moderate-to-heavy mortality during the last ten years as a result of the Douglas-fir beetle and western balsam bark beetle. A number of stands in the Decision Area are at moderate-to-high risk of bark beetle attack because of high stand densities.

3. Forest Service policy and NFMA direction that limits opening size to 40 acres has resulted in a fragmented landscape with scattered openings much smaller than reference condition patch size. Infrequent but extensive stand-replacing fire is the primary ecological process that drives patch size in these forest types. A number of inter-related factors contribute to these extensive stand-replacing fires: topography, climate and climatic cycles, fuel loads, vegetation, fauna, biological cycles, and pre-existing patch size. Populations of native plants and animals have responded and adapted to this disturbance regime. Species abundance and distribution are a result of these dynamic processes and the resulting vegetation patterns. The minimum patch size needed to provide effective security for elk during hunting season is 250 acres. Most of these units are surrounded by stands with moderate-to-high fuel levels.

   In addition to effects on wildlife and vegetation, smaller-than-reference-condition patch size also influences wildfire behavior. Small harvest units allow continuous fuel beds around which wildfires spread fairly easily. Experience on the Rexford Ranger District during the 1994 and 2000 wildfires showed that as wildfire encounters a regeneration unit, the lower fuel levels in the unit resulted in a slow-spreading, low-intensity fire that crept through the unit. However, as a wildfire encountered small-to-medium size regeneration units (3-40 acres) that were surrounded by moderate-to-high fuel levels, the wildfire continued to burn around those units at an unchanged rate of spread and intensity (USDA Forest Service 2001a). A unit matching reference condition patch size, with the fuels treated following harvest, would have a greater chance of slowing the overall rate of spread and intensity.

   Fire effects within these smaller units are reduced, but the fire spread itself in many cases is not changed as the continuous fuels around them are not a deterrent to fire spread or intensity.

Vegetation Figures 3-1 and 3-2 display how unit opening size affects fire spread.

Vegetation Figure 3-1. Effect of 41 acre opening on fire spread of North Fork Fire during July, 1994

These photographs illustrate how the size, harvest prescription, and fuel treatment of a harvest unit can influence fire behavior. In Vegetation Figure 3-1, the "relatively" small size of the unit allowed the fire to spot across the unit and spread around it.

Vegetation Figure 3-2. Effect of 161 acre opening on spread of fire of North Fork Fire during July, 1994

Vegetation Figure 3-2, the size of the unit is consistent with the reference condition for patch size for this forest type. Note that the fire did not spot across the unit.

ANALYSIS OF DIRECT AND INDIRECT EFFECTS

The following evaluation criteria were used to quantitatively evaluate how the alternatives respond to the Purpose and Need for Action and the vegetation concerns identified by the ID Team. Qualitative differences among the alternatives will be addressed in the Effects by Alternative discussions.

- **Acres of stands treated to increase the percentage of fire and disease-resistant tree species**. This evaluation criterion addresses *Purpose and Need statement B, restore historical vegetation species and stand structure.*

Exclusion of ground fires, in conjunction with insect infestation and disease, has resulted in a decrease of early seral, fire-resistant tree species such as ponderosa pine, western larch, subalpine larch and whitebark pine, and an increased amount of shade-tolerant, fire-intolerant, and insect and disease-prone trees (USDA Forest Service 2003a; USDA Forest Service 2003b). This criterion will quantitatively compare how well the Proposed Action and alternatives achieve the Purpose and Need statement B objective of restoring the historical percentage of fire and disease-resistant tree species. The historical percentage of these species is a much more sustainable condition than the existing percentage (USDA Forest Service 2003b).

- **Acres of western larch stands restored to reference conditions, increasing the sustainability of these stands.** This evaluation criterion addresses a more specific aspect of *Purpose and Need statement B, restore historical vegetation species and stand structure.*

The *Northern Region Overview* identified the western larch cover type as "at risk" due to the lack of low-intensity, periodic disturbance, and a shift toward stand-replacing fire, with associated loss of wildlife habitat for some species. The *Northern Region Overview* states: "In terms of vertebrate species at risk, at least eight species are found in this habitat type [emergent larch] and use this habitat type for breeding, foraging and other requirements of their annual cycle" (USDA Forest Service 1998). Additionally, the *Analysis of the Management Situation for the Revision of the Kootenai and Idaho Panhandle Forest Plans* states that strategies need to be developed to restore wildlife habitat provided by the western larch cover type (USDA Forest Service 2003a). Arno and others (1997) found that prior to fire suppression, typical western larch old growth stands in Montana were open and park-like, and were dominated by large-diameter trees with a very light understory. Basal areas ranged from 60-160 ft²/acre, with most stands averaging 70-90 ft²/acre. Currently the stands in all of Unit 29, 50% of Unit 17 and all of Unit 26 (Alternative 3 only) are dominated by an overstory of western larch and Douglas-fir, with an encroaching understory of subalpine fire, lodgepole pine, Engelmann spruce, and other shade tolerant species. Basal area in these units currently ranges from 150 to 200+ ft²/acre. This criterion will quantitatively compare how well the Proposed Action and alternatives achieve the Purpose and Need B objective of restoring western larch stands to an open and park-like reference condition, a stand structure that is more sustainable than the existing structure.

- **Acres of stands where stocking density is reduced, improving the vigor of the stands and lessening ground and ladder fuels.** This evaluation criterion also addresses a more specific aspect of *Purpose and Need statement B, restore historical vegetation species and stand structure.*

High stocking densities occur in a number of stands in the Decision Area. These cause excessive inter-tree competition, which results in stress-related mortality. Densely stocked stands are more susceptible to bark beetle attack. This mortality increases fuel loads and the risk for stand-replacing fire. In addition, crown fires occur more frequently in densely stocked stands and spread faster than crown fires occurring in less dense stands (Graham et al 1999; Scott and Reinhardt 2001; and Pollet and Omi 2002). This high stocking density is due in part to lack of low intensity, periodic disturbance. This criterion will quantitatively compare how well the Proposed Action and Alternatives achieve the Purpose and Need B objective of reducing stocking densities so that they are closer to densities that occurred under natural fire-cycles. These reduced stand densities contribute to a sustainable stand structure that is less susceptible to bark beetle attack and stand-replacing crown fire.

- **Number of early-successional stands/acres where patch size is trending toward reference condition patch size**

- **Number of early-successional stands/acres where patch size would be increased to 250 acres or larger to provide future big game security**. These two evaluation criteria address *Purpose and Need statement C, restore historical patch sizes.*

Infrequent, but extensive stand-replacing fire is the primary ecological process that drives patch size in the Moist and Cold Forest types and the moister portions of the Dry forest type. The first of these two criteria "Number of early-successional stands/acres where patch size would be increased to better match reference condition patch size" quantitatively compares how well the alternatives achieve the broad objective of increasing patch size to better match reference conditions. Patches greater than 95 acres will be considered to achieve this objective because the current sub-basin average is 95 acres (Triepke 2001). Adjacent even-age stands less than 25 years old are included in this calculation. When tree ages in adjacent patches differ by 1/5 or less of the rotation age, those trees can be considered as the same cohort (Adams et al 1994). The second of these criteria compares how well the alternatives achieve the more specific objective of providing future big-game security by developing patch sizes over 250 acres.

- **Number of new openings/acres that are trending away from reference condition patch size.** This evaluation criterion addresses *Purpose and Need statement C, restore historical patch sizes.*

Creating additional small patches that are smaller than the reference condition has implications for continued fragmentation of the Decision Area, as well as fire behavior. This criterion compares how well the alternatives meet the objective of Purpose and Need C by minimizing the development of patch size smaller than reference condition. Patches less than 95 acres will be considered to be trending away from reference patch condition because the current sub-basin average is 95 acres (Triepke 2001).

Vegetation Table 3-1 displays these quantitative differences among the alternatives. There are a number of qualitative differences that will also be discussed in this section.

Vegetation Table 3-1. Vegetation Evaluation Criteria

Alternative	Acres of stands treated to increase the percentage of fire and disease-resistant tree species.	Acres of western larch stands restored to reference condition	Acres of stands where stocking density is reduced	Number of early - successional stands/acres where patch size would be increased	Number of early - successional stands/acres where patch size would be increased to provide future big-game security	Number of new openings/ acres less than reference condition patch size
1	5304	222	3433	6/2234	5/2050	5/161
1M	4865	210	3380	6/1569	3/1088	6/262
2	0	0	0	0	0	0
3	3980	292	2362	6//1640	3/1139	8/341

ALTERNATIVE 2 (NO ACTION)

Summary of Alternative 2 effects

This alternative would not increase the percentage of fire-tolerant, disease and insect-resistant species, or the sustainability of larch stands. It would not improve stand vigor and lessen ladder fuels by reducing stand density, or reduce fragmentation by increasing patch size.

Alternative 2 effect on increasing the percentage of fire-tolerant, disease/insect-resistant tree species

Alternative 2 would not increase the percentage of fire-tolerant, disease/insect-resistant species. Stands in the Decision Area would increase in susceptibility to insects and disease. Mortality from insects and disease attacks would in turn increase ground and ladder fuels making stand replacement fires more likely. Less large-diameter stands would be sustained or developed through time in the Decision Area.

Alternative 2 effect on restoring western larch

Alternative 2 would not restore western larch stands to reference conditions. The stands in Units17, 26 and 29 would remain at risk for stand-replacing crown fire. The trend for these stands would be for ground and ladder fuels to increase. The overall result would be an increased fire risk through time. The vigor of the large western larch would continue to decrease as shade-intolerant trees compete for crown space and other resources. Because western larch is highly shade-intolerant, as stand density increases, the competitiveness of western larch would decrease. Loss of competitiveness of western larch is significant because western larch is the most fire-resistant species in the fire driven ecosystem of the Northern Rockies. At least eight at-risk vertebrate species are found in emergent larch stands and use this habitat type for breeding, foraging, and other life cycle requirements (USDA Forest Service 1998).

Alternative 2 effect on reducing stocking density

Alternative 2 would not reduce stocking density in densely stocked stands. Tree vigor would decline and mortality would increase, resulting in an ensuing increase in fuel loads. High stand density (80 ft^2+/acre) in the Dry Forest types would continue to predispose a number of stands to high levels of Douglas-fir beetle and/or mountain pine beetle attack, depending on the species composition of the stand. High stand densities over 80 ft^2/acre in the Moist and Cold Forest types would continue to predispose a number of stands to high levels of Douglas-fir beetle, western balsam bark beetle, and mountain pine beetle attack, depending on the species composition of the stand. High mortality rates often occur in pulses, which are brought on by a combination of moderate-to-high bark beetle populations and environmental factors, particularly drought and windthrow. These moderate-to-high-risk stands could lose 50% or more of their ponderosa pine, Douglas-fir, lodgepole pine, or subalpine fir component during an outbreak (USDA Forest Service 1994). Resulting stands would be severely understocked (<50 square feet of basal area), and would contain extremely high fuel accumulations (50-100+ tons/acre).

Alternative 2 effect on the number of early-successional stands/acres where patch size is trending toward reference condition patch size and Alternative 2 effect on the number of early-successional stands/acres where patch size would be increased to 250 acres or larger to provide future big game security

Alternative 2 would not decrease long-term fragmentation by consolidating early-successional stands into larger openings that reflect reference condition patch size. Since 1980, there have been 209 harvest openings in the Decision Area that were less than reference condition patch size.

Alternative 2 effect on the number of new openings/acres that are trending away from reference condition patch size

Alternative 2 would not create new openings that trend away from reference condition size.

SUMMARY OF EFFECTS COMMON TO ALL ACTION ALTERNATIVES

Alternative 1, 1M, and 3 effects on increasing the percentage of fire-tolerant, disease/insect-resistant tree species

These alternatives would increase the percentage of fire-tolerant, disease/insect-resistant tree species. Both intermediate and regeneration harvest would be used to achieve this increase. Ecosystem burning and underburning with and without mechanical pre-treatment would also be used to affect this increase in fire-tolerant, disease/insect-resistant species.

Intermediate harvest (commercial thinning) would achieve this change in species composition by retaining a high percentage of healthy, fire and disease-resistant species and harvesting a higher percentage of shade-tolerant species. In the lower-elevation stands, western larch and ponderosa pine would be the featured species for retention. At the mid to lower-alpine elevations (4000-6200 feet), western larch, western white pine, and to a lesser extent, Douglas-fir would be the species featured for retention. In this Decision Area, stands above 6000 feet do not lend themselves to intermediate harvest due to poor access, among other factors.

Regeneration harvest would achieve this change in species composition by retaining healthy fire-resistant trees as seed trees, harvesting all shade-tolerant, fire-susceptible trees and preparing the harvested site for planting and/or natural regeneration of fire-tolerant, disease/insect-resistant species. At the lower elevations, ponderosa pine and western larch would be featured for both natural regeneration and planting. At the mid-to-lower alpine elevations, western larch and rust-resistant western white pine would be featured for natural regeneration and planting. Most regenerated stands would also include a mix of shade-tolerant species, reflective of reference conditions.

Ecosystem burning and underburning with and without mechanical pre-treatment would also affect this increase in fire-tolerant, disease/insect-resistant species. Underburning and ecosystem burning would kill varying amounts of shade-tolerant, fire-susceptible species, mostly in the smaller-diameter classes. Some larger shade-tolerant, fire-susceptible trees may also be killed individually or in small groups. The overall effects would be that a larger percentage of fire-resistant trees would remain on-site after the underburn. This larger percentage of fire-tolerant, disease resistant trees would leave the treated stands more likely to develop and maintain large-diameter trees through time, a more sustainable condition. As with intermediate and regeneration harvest, at the low to mid-elevations, trees benefiting from the underburn/ecosystem burn would be ponderosa pine, western larch, and larger Douglas-fir. At the higher elevations, trees benefiting from the ecosystem burn/underburn would be whitebark pine and subalpine larch. Ecosystem-burning/underburning would benefit the regeneration of whitebark pine by developing openings where the Clark's nutcracker would cache whitebark pine seeds. Cached seeds not retrieved by the birds would later germinate.

Maintenance prescribed burning would not significantly increase fire-tolerant, disease/insect-resistant species, because the initial burn would have already accomplished most of the increase. The maintenance burn would, however, maintain the existing composition of fire-tolerant, disease/insect-resistant tree species.

Although roadside salvage, salvage incidental to burning, and post and pole harvest would achieve other objectives of the Purpose and Need, these harvests are too small in scope to significantly affect stand structure or species composition.

Alternatives 1, 1M and 3 effects on restoring western larch

Alternatives 1, 1M, and 3 would significantly reduce the risk for stand-replacing fire in some western larch stands by a combination of commercial thinning and underburning. The vigor of the large western larch in the treated units would continue to increase as shade-intolerant trees that compete for crown space and other resources would be harvested. Heavy ground fuels would be reduced by underburning the unit after harvest.

Alternative 1, 1M and 3 effects on reducing stocking density

The Action Alternatives would reduce stocking in stands that have high tree densities. Intermediate harvest (commercial thinning) would be the primary method used to modify stand structure, density, and species composition in order to improve vigor and stand resistance to insect attack. Tree density would be reduced by harvesting trees of lesser vigor, thereby re-allocating water, light, and soil resources to the larger, more vigorous trees. Intermediate harvest would not occur in areas where the presence of root disease has been identified, where stands are understocked due to high levels of current mortality, or where stands have a species composition that is not conducive to intermediate harvest methods. Stand density would also be reduced in units treated by prescribed burn with mechanical pre-treatment, but to a lesser degree. With this treatment only trees in subordinate crown position would be felled.

Alternatives 1, 1M, and 3 effects on the number of early-successional stands/acres where patch size is trending toward reference condition patch size and Alternatives 1, 1M, and 3 effect s on the number of early-successional stands/acres where patch size would be increased to 250 acres or larger to provide future big game security

The Action Alternatives would increase the number of early-successional stands/acres where patch size is trending toward reference condition patch size. These alternatives would decrease long-term fragmentation by consolidating early-successional stands into larger openings, through the use of regeneration harvest. These larger openings would trend toward reference condition patch size. Patches greater than 95 acres will be considered to achieve this objective because the current sub-basin average is 95 acres (Triepke 2001). Adjacent even-age stands less than 25 years old are included in this calculation. These alternatives would also increase the number of early successional stands/acres where patch size would be increased to 250 acres or larger to provide future big game security. This would be accomplished by consolidating early successional stands into larger openings, through the use of regeneration harvest.

Alternative 1, 1M, and 3 effects on the number of new openings/acres that are trending away from reference condition patch size

These alternatives would create new openings that trend away from reference condition patch size.

Openings less than 95 acres will be considered to be trending away from reference conditions because the current sub-basin average is 95 acres (Triepke 2001). Adjacent even-age stands less than 25 years old are included in this calculation. In all cases, these openings meet the Purpose and Need of reducing fuel accumulations and/or restoring historical vegetation and stand structure. In a number of units the opening size was limited because the condition being treated was also limited in size. In other cases the opening size was limited by environmental constraints. These will be discussed under the specific alternatives.

Alternatives 1, 1M, and 3 effects of road and recreation proposed activities to the vegetation resource

These alternatives would involve road maintenance, road decommissioning, intermittent stored service, road reconstruction and road additions to the NFSR. These activities would not have a negative impact to the vegetation resource. Minor impacts from the road reconstruction might involve removal of some trees. No additional effects are anticipated from these activities.

Recreation proposed activities include construction of boat ramp, parking area, and restroom, reconstruction of portions of Robinson Mountain trail, renovation of Robinson Mountain Lookout, and existing special use permits. These activities will have no negative effects on the vegetation resource. A minor amount of removal is expected to occur on many of the projects to accommodate safe modes of travel and parking during recreational activities. These impacts are anticipated to be very minor.

Effects by Alternative

Alternative 1

Summary of Alternative 1 effects

Alternative 1 would increase the percentage of fire-tolerant, disease/insect-resistant tree species on 5304 acres, reduce stocking density, improve tree vigor and reduce ladder fuels on 3433 acres, restore western larch stands on 222 acres, trend toward reference patch size in six areas and develop five patches over 250 acres to provide future big-game security. Alternative 1 would use Strategies 2 and 3 to achieve these objectives of the Purpose and Need. Alternative 1 would create five patches totaling 161 acres that would trend away from reference patch size.

Alternative 1 effect on increasing the percentage of fire-tolerant, disease/insect-resistant tree species

Alternative 1 would increase the percentage of fire-tolerant, disease/insect-resistant tree species on 5304 acres.

Intermediate harvest (commercial thinning) would achieve this change in species composition by retaining a high percentage of healthy fire-tolerant and disease-resistant species and harvesting a higher percentage of shade-tolerant species in Units 2, 6, 16, 24, 47, 116, and 220, totaling 664 acres.

Regeneration harvest would achieve this change in species composition by retaining healthy fire-resistant trees as seed trees and snag replacements, harvesting all shade-tolerant, fire-susceptible trees and preparing the harvested site for planting and/or natural regeneration of fire-tolerant, disease/insect-resistant species in Units 12, 17, 19, 21, 23, 25, 29, 30, 38, 40, 53, 112, 129, 138, 211, and 212 totaling 1871 acres.

Ecosystem burning and underburning with and without mechanical pre-treatment would also effect this increase in fire-tolerant, disease/insect-resistant species in Units 1, 3, 5, 10, 13, 14, 46, 48, 52, 103, 111, 118, 120, 125, and 216, totaling 2769 acres.

Maintenance prescribed burning would not increase the percentage of fire-tolerant, disease/insect-resistant tree species, but would maintain the existing composition of fire-tolerant, disease/insect-resistant tree species in Units 4, 7, 8, and 9 totaling 1236 acres,

Alternative 1 effect on restoring western larch

Alternative 1would restore western larch stands to reference conditions in 50% of Unit 17 and in all of Unit 29, totaling 222 acres. This alternative would significantly reduce the risk for stand-replacing fire by a combination of timber harvest and underburning. The vigor of the large western larch in Unit 29 and 17 would continue to increase as shade-intolerant trees that compete for crown space and other resources would be harvested. Heavy ground fuels would be reduced by underburning the unit after harvest.

Alternative 1effect on reducing stocking density

Alternative 1 would significantly reduce stocking density to a level that would reduce tree competition, increase stand vigor, and reduce ladder fuels on 664 acres. Intermediate harvest (commercial thinning) would achieve this significant reduction in stand density by retaining the most vigorous trees, favoring fire and disease-resistant species, and harvesting shade-tolerant trees and trees of lesser vigor in Units 2, 6, 16, 24, 47, 116, and 220.

Alternative 1 would also reduce stocking density to a lesser degree on prescribed burn with mechanical pre-treatment Units 1, 3, 5, 10, 13, 14, 52, 103, 111, and 118, and on ecosystem burn Units 46, 48, 125, and 216 for a sum of 2769 acres. The density reduction in these burn units would only minimally reduce tree competition and increase stand vigor because only subordinate trees would be felled prior to underburning and/or killed during the underburn. However, these latter treatments would significantly reduce ladder fuels.

Maintenance prescribed burning would incidentally reduce stand density in a few areas, but would mostly maintain the existing stand density in Units 4, 7, 8, and 9 and therefore will not be counted in the acres of reduced stand density.

Effect on patch size and number of patches providing future big game security habitat

Alternative 1 would increase the patch size of six early successional stands (1-25 years-old) to 95 acres or greater. Units 12, 17, 19, 21, 23, 25, 29, 30, 38, 40, 138, and 212 would attain this desired large patch size as combined new openings and/or when combined with existing openings and with stands 25 years or younger (refer to MAP 3-4). These larger openings would range from 184 to 598 acres. The average size of these new openings is 372 acres. These larger openings would result in the following effects:

- Change the arrangement and continuity of fuels, reducing the risk that wildfires would escape initial attack. Please refer to the Fuels section for more information.
- Develop effective fuel breaks through the strategic use of large openings. Please refer to the Fuels section for more information.
- Restoration of landscapes composed of long-lived seral species, and fire adapted forest structures (see discussion on fire-tolerant, disease/insect-resistant tree species).
- Decrease fragmentation, increase forage, and develop large blocks of big-game security in 10-15 years. As per Hillis and others (1991), the minimum block size that would offer elk security is 250 acres. This alternative would develop five early-successional patches over 250 acres, at 322, 368, 371, 391, and 598 acres.
- Improve scenic integrity by using timber harvest to decrease geometric patterns in existing units, blending these small unnaturally-appearing existing units into larger openings that emulate natural patterns.

Alternative 1, effect on the number of new openings/acres that are trending away from reference condition patch size

Alternative 1 would create five new openings that trend away from reference condition patch size. These units are: Unit 53 (23 acres), Unit 112 (48 acres), Unit 129 (35 acres), Unit 201 (15 acres) and Unit 211(40 acres). In all of these units, the opening size was limited because the conditions that would be treated were also limited in size. Regeneration harvest would not be silviculturally suitable for areas adjacent to these units.

Alternative 1M

Summary of Alternative 1M effects

Alternative 1M, would increase the percentage of fire-tolerant, disease/insect-resistant tree species on 4865 acres , reduce stocking density, improve tree vigor and reduce ladder fuels on 3380 acres, restore western larch stands on 210 acres, trend toward reference patch size in six areas and develop three patches over 250 acres to provide future big-game security. Alternative 1M would use Strategies 2 and 3 to achieve these objectives of the Purpose and Need. Alternative 1M would create five patches totaling 262 acres that would trend away from reference patch size

Alternative 1M effect on increasing in the percentage of fire-tolerant, disease/insect-resistant tree species

Alternative 1M would increase the percentage of fire-tolerant, disease/insect-resistant tree species on 4865 acres.

Intermediate harvest (commercial thinning) would achieve this change in species composition by retaining a high percentage of healthy fire and disease-resistant species and harvesting a higher percentage of shade-tolerant species in Units 2, 6, 16, 24, 47, 116, and 220, totaling 630 acres.

Regeneration harvest and free selection would achieve this change in species composition by retaining healthy fire-resistant trees as seed trees and snag replacements, harvesting all shade-tolerant, fire-susceptible trees and preparing the harvested site for planting and/or natural regeneration of fire-tolerant, disease/insect-resistant species in Units 12, 17, 19, 21, 23, 25, 29, 30, 38, 40, 53, 112, 129, 138, 211, and 212 totaling 1485 acres.

Ecosystem burning and underburning with and without mechanical pre-treatment would also effect this increase in fire-tolerant, disease/insect-resistant species in Units 1, 3, 5, 10, 13, 14, 46, 48, 52, 103, 111, 118, 120, 125, and 216, totaling 2750 acres.

Maintenance prescribed burning would not increase the percentage of fire-tolerant, disease/insect-resistant tree species, but would maintain the existing composition of fire-tolerant, disease/insect-resistant tree species in Units 4, 7, 8, and 9 totaling 1236 acres.

Alternative 1M effect on restoring western larch

Alternative 1M would restore western larch stands to reference conditions in 50% of Unit 17 and in all of Unit 29, totaling 210 acres. This alternative would significantly reduce the risk for stand-replacing fire by a combination of timber harvest and underburning. The vigor of the large western larch in Units 29 and 17 would continue to increase as shade-intolerant trees that compete for crown space and other resources would be harvested. Heavy ground fuels would be reduced by underburning the unit after harvest.

Alternative 1M effect on reducing stocking density

Alternative 1M would significantly reduce stocking density to a level that would reduce tree competition, increase stand vigor, and reduce ladder fuels on 630 acres. Intermediate harvest (commercial thinning) would achieve this significant reduction in stand density by retaining the most vigorous trees, favoring fire and disease-resistant species, and harvesting shade-tolerant trees and trees of lesser vigor in Units 2, 6, 16, 24, 47, 116, and 220.

Alternative 1M would also reduce stocking density to a lesser degree on prescribed burn with mechanical pre-treatment Units 1, 3, 5, 10, 13, 14, 52, 103, 111, and 118, and on ecosystem burn Units 46, 48, 125, and 216 for a sum of 2769 acres. The density reduction in these burn units would only minimally reduce tree competition and increase stand vigor because only subordinate trees would be felled prior to underburning and/or killed during the underburn. However, these latter treatments would significantly reduce ladder fuels.

Maintenance prescribed burning would incidentally reduce stand density in a few areas, but would mostly maintain the existing stand density in Units 4, 7, 8, and 9 and therefore will not be counted in the acres of reduced stand density.

Effect on patch size and number of patches providing future big game security habitat

Alternative 1M would increase the patch size of six early successional stands (1-25 years-old) to 95 acres or greater. Units 12, 17, 19, 23, 25, 29, 30, 38, 40, 138, and 212 would attain this desired large patch size as combined new openings and/or when combined with existing openings and with stands 25 years or younger (refer to MAP 3-5). These larger openings would range from 99 to 540 acres. The average size of these new openings is 262 acres. These larger opening would result in the following effects:

- Change the arrangement and continuity of fuels, reducing the risk that wildfires would escape initial attack. Please refer to the Fuels section for more information.
- Develop effective fuel breaks through the strategic use of large openings. Please refer to the Fuels section for more information.
- Restoration of landscapes composed of long-lived seral species, and fire adapted forest structures (see discussion on fire-tolerant, disease/insect-resistant tree species).
- Decrease fragmentation, increase forage, and develop large blocks of big-game security in 10-15 years. As per Hillis and others (1991), the minimum block size that would offer elk security is 250 acres. This alternative would develop three early-successional patches over 250 acres, at 269, 279, and 540 acres.
- Improve scenic integrity by using timber harvest to decrease geometric patterns in existing units, blending these small unnaturally-appearing existing units into larger openings that emulate natural patterns.

Alternative 1M, effect on the number of new openings/acres that are trending away from reference condition patch size

Alternative 1M would create six new openings that trend away from reference condition patch size. These units are: Unit 21 (65 acres), Unit 53 (22 acres), Unit 112 (37 acres), Unit 211 (35 acres), Unit 201 (15 acres), and Unit 40 (53 acres). In Units 53, 112, 211, and 201, the opening size was limited because the conditions that would be treated were also limited in size. Regeneration harvest would not be silviculturally suitable for areas adjacent to these units. In Unit 40, the unit size was limited because adjacent areas provide lynx foraging habitat. Regeneration harvest, in the short term, would reduce the effectiveness of this habitat. Unit 21 was limited in size because the prescription on 152 acres was changed from seedtree to a free selection prescription. This change was made in response to public comment.

Alternative 3

Summary of Alternative 3 effects

Alternative 3 would increase the percentage of fire-tolerant, disease/insect-resistant tree species on 3980 acres, reduce stocking density, improve tree vigor, and reduce ladder fuels on 2362 acres, restore western larch stands on 292 acres, trend toward reference patch size in six areas and develop three patches over 250 acres to provide future big-game security. Alternative 3 would use Strategies 2 and 3 to achieve these objectives of the Purpose and Need. Alternative 3 would create eight patches totaling 341 acres that would trend away from reference patch size

Alternative 3 effect on increasing in the percentage of fire-tolerant, disease/insect-resistant tree species

Alternative 3 would increase the percentage of fire-tolerant, disease/insect-resistant tree species on 3980 acres.

Intermediate harvest (commercial thinning) would achieve this change in species composition by retaining a high percentage of healthy fire-tolerant and disease-resistant species and harvesting a higher percentage of shade-tolerant species in Units 2, 6, 16, 24, 47, 54, 26, 116, and 220, totaling 802 acres.

Regeneration harvest would achieve this change in species composition by retaining healthy fire-tolerant trees as seed trees and snag replacements, harvesting all shade-tolerant, fire-susceptible trees, and preparing the harvested site for planting and/or natural regeneration of fire-tolerant, disease/insect-resistant species in Units 12, 17, 19, 21, 23, 25, 29, 30, 38, 40, 53, 112, 129, 211, 212, 225, and 325 totaling 1618 acres.

Ecosystem burning and underburning with and without mechanical pre-treatment would also affect this increase in fire-tolerant, disease/insect-resistant species in Units 1, 3, 10, 13, 14, 46, 52, 103, 110, 111, 118, 120, 125, and 203 totaling 1560 acres.

Maintenance prescribed burning would not increase the percentage of fire-tolerant, disease/insect-resistant tree species, but would maintain the existing composition of fire-tolerant, disease/insect-resistant tree species in Units 4, 7, 8, and 9 totaling 1236 acres,

Alternative 3 effect on restoring western larch

Alternative 3 would restore western larch stands to reference conditions in 50% of Unit 17 and in all of Units 26 and 29, totaling 292 acres. This alternative would significantly reduce the risk for stand-replacing fire by a combination of timber harvest and underburning. The vigor of the large western larch in Units 29 and 17 would continue to increase as shade-tolerant trees that compete for crown space and other resources would be harvested. Heavy ground fuels would be reduced by underburning the unit after harvest.

Alternative 3 effect on reducing stocking density

Alternative 3 would significantly reduce stocking density to a level that would reduce tree competition, increase stand vigor, and reduce ladder fuels on 802 acres. Intermediate harvest (commercial thinning) would achieve this significant reduction in stand density by retaining the most vigorous trees, favoring fire-tolerant and disease-resistant species, and harvesting shade-tolerant trees and trees of lesser vigor in Units 2, 6, 16, 24, 47, 54, 26, 116, and 220.

Alternative 3 would also reduce stocking density to a lesser degree on prescribed burn with mechanical pre-treatment Units 1, 3,10, 13, 14, 52, 103, 110, 11 ,118, 120, and 203, and on ecosystem burn Units 46 and 125, for a sum of 1560 acres. The density reduction in these burn units would only minimally reduce tree competition and increase stand vigor because only subordinate trees would be felled prior to underburning and/or killed during the underburn. However, these latter treatments would significantly reduce ladder fuels.

Maintenance prescribed burning would incidentally reduce stand density in a few areas, but would mostly maintain the existing stand density in Units 4, 7, 8, and 9 and therefore will not be counted in the acres of reduced stand density.

Effect on patch size and number of patches providing future big game security habitat

Alternative 3 would increase the patch size of seven early successional stands (1-25 years-old) to 95 acres or greater. Units 12, 17, 19, 21, 23, 25, 29, 30, 38, 40, and 212 would attain this desired large patch size as combined new openings and/or when combined with existing openings and with stands 25 years or younger (refer to MAP 3-6). These larger openings would range from 101 to 432 acres. The average size of these new openings is 273 acres. These larger opening would result in the following effects:

- Change the arrangement and continuity of fuels, reducing the risk that wildfires would escape initial attack. Please refer to the Fuels section for more information.

- Develop effective fuel breaks through the strategic use of large openings. Please refer to the Fuels section for more information.
- Restoration of landscapes composed of long-lived seral species, and fire adapted forest structures (see discussion on fire-tolerant, disease/insect-resistant tree species).
- Decrease fragmentation, increase forage, and develop large blocks of big-game security in 10-15 years. As per Hillis and others (1991), the minimum block size that would offer elk security is 250 acres. This alternative would develop three early-successional patches over 250 acres, at 371, 391, and 432 acres.
- Improve scenic integrity by using timber harvest to decrease geometric patterns in existing units, blending these small unnaturally-appearing existing units into larger openings that emulate natural patterns.

Alternative 3, effect on the number of new openings/acres that are trending away from reference condition patch size

Alternative 3 would create eight new openings that trend away from reference condition patch size. These units are: Unit 28 (27 acres), Unit 25 (56 acres), Unit 53 (23 acres), Unit 112 (48 acres), Unit 129 (35 acres), Unit 211(40 acres), Unit 225 (42 acres) and Unit 325 (70 acres). In Units 28, 53, 112, 129, and 211, the opening size was limited because the conditions that would be treated were also limited in size. Regeneration harvest would not be silviculturally suitable for areas adjacent to these units. Units 25, 225, and 325 were split from Alternative 1, Unit 25 to meet MA 12 Wildlife and Fish Forest Plan Standard 6, "Maximize edge effect within economical timber harvest constraints, by shaping timber harvest units and maintain movement corridors of at least two sight distances between corridors."

CUMULATIVE EFFECTS

The Cumulative Effects Worksheet, located in the Vegetation Section of the Project File, contains the detailed analysis of all past, current, and reasonably foreseeable activities listed in Tables 3-1 and3-2. All activities identified to occur within the Analysis Area that have the potential to affect the Vegetation resource are discussed below. Cumulative effects are the result of all the impacts that past, current and reasonably foreseeable activities have on a resource. The results of past activities are described in the section titled "Summary of Existing Condition" below. The anticipated effects from proposed activities were added to the existing condition and described in the section titled "Summary of Direct and Indirect Effects of the Action Alternatives on the Existing Condition". Then the impacts of current and reasonably foreseeable actions are added to the effects described in the direct and indirect effects section below. The sum of all these effects is the cumulative effects. The Analysis Area considered for cumulative effects was the same as the Project Area.

Bounds of Analysis

The Young Dodge analysis area is the boundary for cumulative effects for the vegetation resource. This is because direct vegetation treatment effects occur only on the actual area treated. Effects of the vegetation treatment will cross the bounds of time into the future and is analyzed for future projects. However, the effects of the vegetation treatment on a specific treatment area will not be affected by those occurring on another.

Summary of the Effects of Past Actions on the Existing Condition

Past actions have led to the current condition of vegetation. Past regeneration harvest, limited to openings of 40 acres or less, has led to patch sizes that are smaller than reference condition. Fire suppression, in some portions of the Analysis Area, has led to increased stand density and an increase in the percentage of shade tolerant trees. This increased stand density and increase in shade tolerant trees has lessened the vigor of shade intolerant trees that tend to be fire-tolerant and disease/insect-resistant tree species. Young shade tolerant trees and increased stand density also put normally fire-tolerant trees at risk by increasing ladder fuels and canopy bulk density, two conditions that make it easier for a ground fire to become a stand-replacing crown fire. A shade intolerant tree at particular risk is western larch. The *Northern Region Overview* identified the western larch cover type as "at risk" due to the lack of low-intensity, periodic disturbance, and a shift toward stand-replacing fire, with associated loss of wildlife habitat for some species (USDA Forest Service 1998). Additionally, the *Analysis of the Management Situation for the Revision of the Kootenai and Idaho Panhandle Forest Plans* states that strategies need to be developed to restore wildlife habitat provided by the western larch cover type (USDA Forest Service 2003a).

Summary of Direct and Indirect Effects of the Action Alternatives on the Existing Condition

Alternative 1, would increase the percentage of fire-tolerant, disease/insect-resistant tree species on 5304 acres, reduce stocking density, improve tree vigor, and reduce ladder fuels on 3433 acres, restore western larch stands on 222 acres, trend toward reference patch size in six areas (2234 total acres), and develop five patches over 250 acres to provide future big-game security. Conversely, Alternative 1 would create five patches totaling 161 acres that would trend away from reference patch size. However, this slight trending away from reference patch size is more than offset by the six areas on 2234 acres that trend toward the reference condition patch size.

Alternative 1M, would increase the percentage of fire-tolerant, disease/insect-resistant tree species on 4865 acres, reduce stocking density, improve tree vigor, and reduce ladder fuels on 3380 acres, restore western larch stands on 210 acres, trend toward reference patch size in six areas and develop three patches over 250 acres to provide future big-game security. Conversely, Alternative 1M would create five patches totaling 262 acres that would trend away from reference patch size. However, this slight trending away from reference patch size is more than offset by the six areas on 1569 acres that trend toward the reference condition patch size.

Alternative 3, would increase the percentage of fire-tolerant, disease/insect-resistant tree species on 3980 acres, reduce stocking density, improve tree vigor, and reduce ladder fuels on 2362 acres, restore western larch stands on 292 acres, trend toward reference patch size in six areas (1640 total acres), and develop three patches over 250 acres to provide future big-game security. Conversely, Alternative 3 would create eight patches totaling 341 acres that would trend away from reference patch size. However, this trending away from reference patch size is more than offset by the six areas on 1640 acres that trend toward the reference condition patch size.

Effects of Current and Reasonably Foreseeable Actions

Vegetation Management and Fuels Reduction Activities

These activities trend the site-specific portions of the Analysis Area toward an improved condition. The 2000 acres of precommercial thinning planned between 2012 and 2019 would reduce stand density and increase the percentage of fire-tolerant, disease/insect-resistant tree on the treated acres. Any blow down salvage conducted would be done under the appropriate analysis. The approximately 93 acres of commercial thinning for the Dodge Creek mountain pine beetle project will help create vigorous stand of trees. These areas will be able to better withstand a low-to-moderate intensity wildfire and will reduce the risk of mountain pine beetle infestation and spread. The effects described above would be the same for Alternatives 1, 1M, 2, and 3.

Cattle Grazing

For Alternatives 1, 1M, 2, and 3, the major effect of cattle grazing is soil compaction (see soils discussion) and the occasional browsing and trampling of seedlings.

Noxious Weed Treatment

For Alternatives 1, 1M, 2, and 3, the noxious weed treatment would reduce the amount of non-native invasive plants on the treated areas. There may be some curling and browning of conifers and hardwoods in the immediate vicinity of the noxious weed treatment, but should not result in mortality of the affected trees.

Fire Suppression

There would be cumulative effects to the vegetation resource from fire suppression. Control of wildfires is expected to contribute to accumulations of dead and down fuels, and the vigorous undergrowth of small tree thickets that could accelerate initiation of major crown fires in forest stands. This continued increase of live and dead fuels would greatly increase the risk of stand-replacement fires in dry years. This activity would not contribute to achieving desired stand conditions. Fire suppression would allow stand densities to increase in the areas affected by fire suppression, and to increase the dominance of shade-tolerant, fire-susceptible species in the areas affected by fire suppression. The implementation of Alternatives 1, 1M, and 3 would somewhat ameliorate the effects of future fire suppression. The implementation of Alternative 2 (No Action), and future fire suppression would cumulatively result in the accumulations of ground and ladder fuels, and an increase in fire-susceptible tree species. This increase in fuels and fire-susceptible trees would greatly increase the risk of stand-replacement fires in dry years. Western larch stands would remain at risk, or increase in risk for stand replacing crown fire

Road Management

For Alternatives 1, 1M, 2, and 3, the major effect road management would have on vegetation is the clearing of vegetation along road right-of-ways. Approximately 1.5 miles would be cleared. At a high road density of 3 miles of road per square mile, this clearing would affect 0.7 percent of the area. This low percent of affected area would not have a significant effect on the composition or structure of vegetation in the Decision Area.

Recreation Maintenance

For Alternatives 1, 1M, 2, and 3, developed recreational sites compose much less than one percent of the Project Area's acreage, maintenance activity on developed recreation sites would not have a significant effect on the structure and composition of vegetation in the Project Area.

Special Uses

For Alternatives 1, 1M, 2, and 3, special uses in the Project Area affect less than one percent of the project areas land base. Therefore, special uses would have little effect on the structure and composition of vegetation in the Project Area.

Public Use

For Alternatives 1, 1M, 2, and 3, firewood cutting and berry picking generally occur within 200' of open roads. Most of the firewood cutting occurs on the uphill side of the road. Non-commercial berry picking would not injure the berry producing vegetation and would have no effect on the structure and composition of vegetation in the Project Area. Because only dead trees would be cut for firewood, this activity would have little effect on the structure and composition of live vegetation in the Project Area.

Private Property

For Alternatives 1, 1M, 2, and 3 actions on private property would not have a direct effect on effect on the structure and composition of vegetation in the Project Area. This is because direct vegetation treatment effects occur only on the actual area treated.

Other Agency

For Alternatives 1, 1M, 2, and 3 thinning of 50 adjacent acres on Montana Fish, Wildlife, and Parks would not have on effect on the structure and composition of vegetation in the Project Area.

Cumulative Effects Finding

There could be cumulative effects associated with past actions, as these have contributed to the distribution, structure and species composition. Past regeneration harvest, limited to openings of 40 acres or less, has led to patch sizes that are smaller than reference condition. Fire suppression, in some portions of the Analysis Area, has led to increased stand density and an increase in the percentage of shade tolerant trees. This increased stand density and increase in shade tolerant trees has lessened the vigor of shade intolerant trees that tend to be fire-tolerant and disease/insect-resistant tree species. Young shade tolerant trees and increased stand density also put normally fire-tolerant trees at risk by increasing ladder fuels and canopy bulk density, two conditions that make it easier for a ground fire to become a stand-replacing crown fire. Current and reasonably foreseeable vegetation management and fuel reduction activities are ameliorating these conditions. Thinning and underburning will reduce stand density and increase the percentage of fire-tolerant, disease/insect-resistant trees. Planting will also increase the percentage of fire-tolerant, disease/insect-resistant trees. The cumulative effect of the activities proposed by Alternatives 1, 1M, and 3, combined with the past, current, and reasonably foreseeable actions would be a trend toward the desired condition expressed of Page I-3 of Chapter 1. Alternative 2 would not contribute to a positive trend toward the desired condition.

CONSISTENCY WITH REGULATORY FRAMEWORK

FOREST PLAN DIRECTION

Alternatives 1, 1M, and 3 are consistent with the Forest Plan goal to control insects and disease to historic endemic levels (USDA Forest Service 1987a II-4). These alternatives use treatments that would effectively treat the stands that have high stand densities. Alternative 2 is not consistent with this Forest Plan goal. High stocking levels in a number of stands would allow current trends to continue that would result in an increasing level of bark beetle attack.

Alternatives 1, 1M, and 3 are consistent with the Forest Plan goals to “Use prescribed fire to simulate natural ecological processes, prevent natural and activity fuel buildups, create habitat diversity for wildlife, reduce suppression costs, and maintain ecosystems” and to “Protect Forest users, property and resources from wildfire” (USDA Forest Service 1987a II-2).

Because Alternative 2 would not reduce fuels or use prescribed fire, it would not be consistent with these goals.

Alternatives 1 and 1 M would need a project-specific Forest Plan amendment to MA 12 Timber Standard #2 to allow timber harvest adjacent to existing openings in big game movement corridors.

Alternatives 1 and 1M would need a project-specific Forest Plan amendment to Management Area (MA) 12 Fish and Wildlife Standard #7 to allow timber harvest in new units that exceed 40 acres when combined with existing units.

Alternatives 1, 1M, and 3 would result in harvest openings greater than 40 acres. The creation of openings greater than 40 acres would require the approval of the Regional Forester.

OTHER LAWS AND REGULATIONS

Compliance with NFMA and Forest Plan to restock areas of even-aged harvest within five years – Forest Service policy states that timber harvest and regeneration practices shall be designed to assure lands are adequately restocked within five years following final harvest. Kootenai Forest and Rexford Ranger District regeneration data demonstrates that proposed harvest sites can be adequately restocked within five years from the time of harvest, and that proposed activities would be expected to comply with the Forest Plan. Regeneration survey records on the Rexford Ranger District have been analyzed for each VRU affected by proposed units in this project. A regional report (Regen Time Frame Report) in the District's TSMRS database was used to obtain reforestation success results. Refer to Vegetation Table 3-2.

Vegetation Table 3-2. Regeneration Success – Percent of Stands Restocked Within Five Years*

Forest Type	Rexford Ranger District Results (Natural regeneration and planting combined)	
	(% of Stand)	(% of Acres)
Dry Forest (n = 23) (VRUs 1, 2 and 3)**	85%	90%
Moist Forest (n = 39) (VRUs 5 and 7)**	98%	97%
Cold Forest (n = 100) (VRU 9)**	93%	95%

* Data for this Analysis Area as of 11/16/2007

** n = number of stands in sample

The data shows that harvest sites are highly likely to be adequately restocked within five years of the proposed harvest.

NOXIOUS WEEDS

INTRODUCTION

Noxious weeds are non-native plant species that have highly invasive characteristics, are very aggressive, and have a high potential for causing severe economic or environmental impacts. Characteristics of noxious weed species include:

- Crowding out and competing with valuable native plant species.
- Reducing forage for big game and cattle. Noxious weeds are generally less palatable and nutritious than native plants.
- Reducing habitat for native birds and small animals.
- Increasing soil erosion by reducing vegetative cover and organic litter on the ground. If this occurs in riparian areas it can lead to an increase in soil erosion that degrades water quality and fish habitat.
- Diminishing recreation opportunities. Reduced forage and spawning habitat results in diminishing hunting and fishing opportunities.

Noxious weed species are often broadly adapted to a wide variety of ecological conditions, and are adapted to reproduce explosively. Most were brought to North America without their natural limiting factors including insects and diseases. Most of the species have easily transportable seed, and take advantage of human and animal movement. They are well adapted to establishment in areas of human-caused or natural disturbance. Examples include areas affected by wildfires, gravel pits, road construction, cattle grazing, skid trails, and log landings created during harvest of timber stands.

ANALYSIS AREA

The Analysis Area for noxious weeds is the same as the Decision Area. This is because any ground-disturbing activities occurring within the Decision Area could affect noxious weed populations.

REGULATORY FRAMEWORK

The State of Montana County Noxious Weed Management Act (MCA 7-22-2116) states “it is unlawful for any person to permit any noxious weed to propagate or go to seed on the person’s land, except that any person who adheres to the noxious weed management program of the person’s weed management district or who has entered into and is in compliance with a noxious weed management agreement is considered to be in compliance with this section”. The KNF has entered into an agreement with Lincoln County in the form of a Memorandum of Understanding (MOU). This MOU states “the purpose of this agreement is to document the sharing of expenses and materials between the Forest Service and the County to accomplish mutually beneficial objectives related to the control of invasive and noxious weeds on National Forest System lands and/or private lands” within specific provisions and in accordance with a Financial and Operating Plan.

Executive Order 13112 of 1999 directs federal agencies to prevent the introduction of invasive species; detect and respond rapidly to and control populations of such species in a cost-effective and environmentally sound manner; to monitor invasive species populations accurately and reliably; to provide for restoration of native species and habitat conditions in ecosystems that have been invaded; to conduct research on invasive species and develop technologies to prevent introduction; to provide for environmentally sound control of invasive species; and promote public education on invasive species and the means to address them. The agencies are also not to authorize, fund or carry out actions that are likely to cause or promote the introduction and spread of invasive species. All these actions are subject to the availability of appropriations.

The Federal Noxious Weed Act of 1974 states that each federal agency shall establish and adequately fund an undesirable plants management program, complete and implement cooperative agreements with State agencies regarding the management of undesirable plant species on Federal lands under the agency's jurisdiction, and establish an integrated management system to control or contain undesirable plant species targeted under cooperative agreements.

The Federal Insecticide Fungicide and Rodenticide Act (FIFRA) Public Law 92-516 requires all pesticides to be registered with the EPA. It also states that it is unlawful to use any registered pesticide in a manner inconsistent with its labeling.

The Carlson-Foley Act, Public Law 90-583 of 1968 authorizes and directs heads of Federal Departments and Agencies to permit control of noxious plants by State and local governments on a reimbursement basis in connection with similar and acceptable weed control programs being carried out on adjacent non-federal land. In other words, this act permits county and state officials to manage noxious weeds with herbicides on Federal lands and to be reimbursed for that management, given that other applicable laws such as NEPA are also met.

Public Law 94-579, the Federal Land Policy and Management Act of 1976, provides authority to control weeds on rangelands as part of a rangeland improvement program.

AFFECTED ENVIRONMENT

The dominant noxious weed in the Analysis Area is spotted knapweed. Canada thistle, sulfur cinquefoil, oxeye daisy, St. Johnswort (goatweed), orange and yellow hawkweeds, tansy ragwort, and hounds tongue are also present.

Noxious Weeds Table 3-1, below, lists the occurrence and location of known noxious weed populations in the Analysis Area. Refer to the noxious weeds section of the Project File for a map showing the location of noxious weeds in the Analysis Area. It is recognized that these are not the only locations of weeds, but they represent areas of known infestations.

Noxious Weeds Table 3-1 Status of Noxious Weeds in the Decision Area

Occurrence	Location/Comments
A few scattered noxious weed plants	303G, 303H, 303K, 337A, 7131, 7164, 7168B, 7224B, and 7224D.
Scattered noxious weed infestations that are less than 75 feet in length and that have 50 to 70% noxious weed plant cover	337A, 470, 92Z, 7168, 7168C, 7224C, and 14081.
Scattered-to-continuous noxious weed infestations that are more than 75 feet in length and that have over 70% noxious weed plant cover	303, 303L, 999, 7173A, and 7205.
Wide-spread noxious weed infestations that cover over 20 acres are present	303F and 7173D.

ANALYSIS OF DIRECT AND INDIRECT EFFECTS

The direct and indirect effects Analysis Area is described under the Analysis Area section. This section considers direct effects of proposed management activities. It also analyzes the indirect effects of open roads on the spread of weed populations. All activities that disturb the ground increase the potential to scatter noxious weed seed, which would likely start new infestations or increase the size and rate of spread of existing infestations. These activities include prescribed burning, road grading, construction of fire lines and excavated skid trails, and skidding or piling logs at a landing. Areas of disturbance not only offer a seed bed for weeds, but are relatively warmer, drier sites free of competition. This seems to especially benefit weeds that normally grow poorly under the forest canopy.

Dry vegetation types with open tree canopies have the highest potential for invasion and rate of spread of noxious weeds. Disturbed sites located at elevations below 4000 feet with south or west aspects, which tend to be drier and warmer, are at higher risk than sites located at elevations above 4000 feet with north or east aspects, which tend to be wetter and cooler.

This effects analysis focuses on the potential risk of project activities to scatter noxious weed seed and the seed bed that is created by management activities. This assessment assumes that all areas with proposed activity have a similar seed source and risk of invasion is rated on the amount of ground disturbance anticipated from each alternative.

Alternative 1 would have the highest potential for weed spread based on the number of acres treated with harvest and burning, burning without harvest, burning with mechanical pre-treatment, and roadside salvage. Best Management Practice road improvements are also slightly higher than in Alternatives 1M and 3. Decommissioned and intermittent stored status roads are the same for the three action alternatives. Open road mileage is the same for all alternatives.

Alternatives 1M and 3 would have less risk for weed spread. These alternatives have fewer acres of treatment in all categories than Alternative 1. Alternative 3 has 3 fewer miles of BMP improvements than Alternative 1. Alternative 1M has the same road improvements as Alternative 1.

Alternative 2 would have the least risk for weed spread. This alternative would propose no new ground disturbing activities. Weed infestations would spread in more remote areas, where current weed treatments are limited by access. Weed populations would continue to be treated routinely as allowed by the Kootenai National Forest Invasive Plant Management Project (USDA Forest Service 2007).

ANALYSIS OF CUMULATIVE EFFECTS

The cumulative effects Analysis Area for Noxious Weeds is described in the Analysis Area section above. The Cumulative Effects Worksheet, located in the Noxious Weeds Section of the Project File, contains the detailed analysis of all past, current, and reasonably foreseeable activities listed in Tables 3-1 and 3-2 (pp III-2 through III-4) in Chapter III. All activities identified to occur within the Analysis Area that have the potential to affect the Noxious Weed resource are discussed below.

Cumulative effects are the result of all the impacts that past, current, and reasonably foreseeable activities have on a resource. The results of past activities are described in the section titled "Summary of Existing Condition" below. The anticipated effects from proposed activities were added to the existing condition and described in the section titled "Summary of Direct and Indirect Effects of the Action Alternatives on the Existing Condition". Then the impacts of current and reasonably foreseeable actions are added to the effects described in the direct and indirect effects section below. The sum of all these effects is the cumulative effects.

Summary of the Effects of Past Actions on the Existing Condition

Past actions have led to the current situation for noxious weeds. Roads, trails, and ground-disturbing management activities have created pathways and transport mechanisms for noxious weed seed transport and created seed beds for the transported seeds. Noxious weeds have come from a variety of sources outside of traditional forest management activities. However, forest management activities have provided many suitable habitats for a variety of noxious weed species. These activities are catalogued in Appendix 5 of the FSEIS and the Transportation section of the FSEIS. Noxious weed treatments have also affected the size and number of noxious weed populations. Treatments on the north end of the Kootenai National Forest began in earnest several years before treatments were started on the south end. Because of this, populations on the Rexford Ranger District and this Analysis Area are relatively confined.

Summary of Direct and Indirect Effects of the Action Alternatives on the Existing Condition

Alternative 1 would add 6932 acres of ground-disturbing treatment to the Analysis Area. It is unlikely that many weeds are currently growing in proposed units, except in areas that are receiving maintenance treatments. These previously unmanaged stands are likely candidates for noxious weeds, either directly from management activities or indirectly from other vectors (vehicles on open roads, animals, etc.) that transport seeds from outside the units. In some cases, where vegetated road surfaces are cleared to access units, treatment options would increase and new opportunities for control would occur. Pre-activity weed spraying could also be conducted to limit further weed spread.

Alternative 1M would add 6478 acres of ground-disturbing treatment to the Analysis Area. This alternative is similar to Alternative 1, but would have fewer effects due to fewer treatment acres.

Alternative 2 would not add any new ground-disturbing treatment to the Analysis Area. This includes both new units and opening vegetated roads. This alternative would not change the condition of noxious weeds in the Analysis Area. No new areas would be disturbed and no new access would be created for treatment.

Alternative 3 would add 5608 acres of ground-disturbing treatment to the Analysis Area. This alternative is similar to Alternative 1, but would have fewer effects due to fewer treatment acres.

Effects of Current and Reasonably Foreseeable Actions

Vegetation Management and Fuels Reduction Activities

These ground-disturbing activities would have some effect on noxious weeds. Precautions utilizing contract clauses for monitoring are continually utilized on activity areas to aid in early detection and treatment of new infestations. Ongoing weed treatment under the Kootenai National Forest Invasive Plant Management Record of Decision (2007) is used to treat existing weed populations.

Cattle Grazing

Cattle occasionally graze on weed species and pass seeds on as they graze across forest lands. All animals are seed vectors for some species of weeds, cattle being no different. Seed beds may also be created in areas where cattle congregate, although these areas appear to be limited within the Analysis Area. Effects from grazing are difficult to quantify, they are dispersed, and generally recognized as occurring, but are not a major concern at this time.

Fire Suppression

Activities associated with fire suppression can increase weed populations by bringing in new weed species from outside the area, creating seed beds through suppression actions, and from the fires themselves. Precautions such as weed washing stations, fire line rehabilitation, and revegetation, in some cases, help limit the spread of noxious weeds. Due to the uncertain nature of where and when fire suppression may occur, effects cannot be quantified here, but it is recognized that fire suppression will occur in the future, and mitigation measures will be implemented, as appropriate.

Road Management

Any road management activities that include soil disturbance could create suitable conditions for weed spread. All activities would utilize BMPs to limit soil disturbance, revegetate areas as quickly as practical, and limit transport of weeds. Weed management would continue to occur along all open roads.

Special Uses

New utility corridors would be the main concern for weed spread in areas where ground disturbance is necessary to complete work (plowing in power or phone lines). These areas would be monitored and treated as appropriate.

Public Use

Public use can spread noxious weeds mainly through road systems as weed seeds are caught on vehicles and transported to new locations or are spread through horse use. This is handled through ongoing weed treatments and monitoring.

Private Property

Private property will always have the potential to spread weeds onto National Forest System lands. Monitoring and treatment on FS lands adjacent to private is the most efficient way in which to treat these areas.

Other Agency

The State of Montana is planning to conduct approximately 50 acres of commercial thinning adjacent to roads within their Wildlife Management Area. BMPs would be utilized to minimize the spread of noxious weeds with this project.

Cumulative Effects Finding

There could be cumulative effects associated with past actions, as these may have contributed to ground disturbance, which would have encouraged the start of new infestations or increased the size and rate of spread of existing infestations. There would be cumulative effects to noxious weeds from vegetation management and fuel reduction activities, cattle grazing, fire suppression, road management, special uses, public use, private property, and other agency actions in association with Alternatives 1, 1M, 2, and 3. Treatments would continue on known infestations, and precautions would be taken to prevent further spread of both existing weed populations and new invaders. The cumulative effect of the past, proposed, current, and reasonably foreseeable actions is that as new ground disturbance occurs, opportunities for weed spread occurs. Use of Best Management Practices should limit expansion of existing weed populations, but there is still potential for weed spread. Future implementation of the Kootenai National Forest Invasive Plant Management Record of Decision (2007) would help control existing weed populations and limit further spread into new areas.

CONSISTENCY WITH REGULATORY FRAMEWORK

FOREST PLAN DIRECTION

One of the Forest Plan goals states, “Attempt to stop the spread and suppress the existing levels of noxious weeds through land management and weed suppression activities…” (USDA Forest Service 1987a II-2). Alternatives 1, 1M, and 3 include contractual provisions for treatment of noxious weeds and are therefore, consistent with Forest Plan direction. There would be no new treatments for noxious weeds specific to the implementation of Alternative 2. Alternative 2 would be consistent with Forest Plan direction regarding noxious weeds because it does not propose any additional ground-disturbing activities, and would not directly lead to the further spread of weed populations.

OTHER LAWS AND REGULATIONS

This project is consistent with all the laws and regulations described earlier under “Regulatory Framework”.

THREATENED, ENDANGERED, AND SENSITIVE PLANTS

INTRODUCTION

The U.S. Fish and Wildlife Service (USFWS) provided a list of threatened and endangered plant species that are known or expected to occur on the KNF (USFWS 2009 website). The only proposed or endangered plant species known to occur within the Planning Sub-unit (PSU) is whitebark pine (*Pinus albicaulis*).

Sensitive plant status is managed under the authority of the National Forest Management Act (PL 94-588). They are administratively designated by the Regional Forester (Kimbell 2004, 2005; Weldon 2011), and are those species for which population viability is a concern. The sensitive plants section of the Project File contains an extensive list of the species considered for the Young Dodge PSU. A preliminary review indicated a number of species that have a low-to-no probability of occurrence in the PSU in habitats proposed for management activities. They were dropped from further evaluation (refer to the Project File). The proposed alternatives would have *no impact* on those species or their habitat.

Listed Plants Table 3-1 displays the listed plant species with a moderate-to-high probability of occurrence in the PSU where management activities are proposed. These species were considered for this analysis. Plants are arranged by general habitat characteristics.

EXISTING CONDITION AND TRENDS

The Young Dodge PSU is the context for the present analysis. This area supports a diversity of dry, moist, and cold forest conditions, depending on the elevation, aspect, and landtype of the particular area. “Listed” plant habitats often occur as uncommon microsites within the greater forests. With some species, the habitat may appear common, but the species may be rare for other reasons – reproductive biology, substrate requirements, and species on the periphery of their range.

Many listed plants inhabit areas associated with riparian habitats. Protective guidelines exist that prevent or severely restrict the type and extent of activities that occur in riparian areas. The Inland Native Fish Strategy (INFS) guidelines (USDA Forest Service 1995b), and Montana Stream Management Zone Act guidelines establish buffers around streams, ponds, bogs, and any riparian zone, essentially restricting management activities in these areas. Four other general habitat descriptions and conditions are presented below. Listed plants occurring in these habitats have a moderate-to-high probability of occurrence in the PSU. Previous surveys of suitable and/or unique habitats have identified two sensitive plant locations within the PSU. Two listed moonwart species: (*B. montanum, and B. ascendens*) have been located at a single site in the upper portion of the Young Creek drainage. Additional surveys of the proposed treatment units conducted during the 2007 field season discovered *Eriophorum gracile* (Slender Cottongrass) within a riparian area located in a proposed treatment unit.

Listed Plants Table 3-1. Possible Listed Plant Occurrence in the PSU

Plant Species	Habitat Description	Reference Condition	Existing Condition
Amerorchis rotundifolia *Botrychium montanum* *Carex var.sp.* *Collema curtisporum* *Cypripedium var.sp.* *Dryopteris cristata* *Eriophorum gracile* *Lycopodium dendroideum* *Meesia triquetra* *Ophioglossum pusillum* *Phegopteris connectilis* *Scheuczheria palustris* *Scirpus subterminalis* *Utricularia intermedia* *Tricophorum cespitosum* ***Howellia aquatilis****	***Riparian forests*** **–** Habitat includes areas of moist forest plant communities, often dominated by spruce, cedar, and/or hardwoods. These sites typically occur in mature forest condition (greater than 100 years old), have upwards of 60% canopy closure, and occur near surface waters. Several of these species associated with mid to high-elevation fens, bogs or marshes. *Tricophorum cespitosum* has been found in Lincoln and Flathead counties (www.mtnhp.org)	Riparian forest occurs primarily along streams in the PSU. Disturbances include occasional low intensity fire, insect or disease mortality, snow-loading damage, wind damage, flooding, and light ungulate use. High severity fire occurred over century time scales.	Past disturbance has impacted many riparian habitats and were subject to wildfire, flooding, cattle grazing, road construction, and timber harvesting, as well as permanent destruction with the creation of Koocanusa Reservoir. Some riparian forest communities were impacted with the 2000 fires. Bogs, fens, and marshes are not common within the PSU and are typically associated with low flowing streams. *E. gracile*, *B. montanum*, and *B. ascendens* are the only listed species found in the PSU during field surveys.
Botrychium crenulatum *Botrychium paradoxum* *Grimmia brittoniae* *Phegopteris connectilis*	***Coniferous forests*** **–** Habitat requirements typically include moist-to-dry, closed canopy, mature forest in areas that experience disturbance on long time scales.	Infrequent fire favored the development of multi-strata forest with moist micro-climate sites under the forest canopy.	Suitable habitat exists within and adjacent to proposed treatment units. Most of this habitat consists of mixed conifer spruce/sub-alpine fir/lodgepole pine with various amounts of seral, shade-intolerant Douglas-fir and western larch. Fire suppression has had some impact to these habitats, mainly through creating more continuous fuel across the landscape resulting in fire burning over larger

Plant Species	Habitat Description	Reference Condition	Existing Condition
			areas and often with higher than normal intensities due to excessive fuel loading. Therefore, a decline in available suitable habitat, though minor, has occurred due to fire suppression and timber harvest.
Clarkia rhomboidea *Lathyrus bijugatis* *Lomatium geyeri* *Grindelia howellii* *Mimulus clivicola* ***Silene spaldingii****	***Open, dry forests and meadows*** **–** Habitat includes open Douglas-fir, ponderosa pine, and larch forests. *Lomatium geyeri* is often found on rocky, thin soils. Greatest potential for mimulus is in moist crevices, pockets and other moist microclimates within these dry forests. *Silene spaldingii* has been found only in the Tobacco Valley east of the PSU and across Koocanusa reservoir.	Suitable forest habitat was created and maintained by frequent, low intensity fires, especially on drier/warmer slopes in the PSU. Natural fires would kill off smaller, thin-bark trees providing reduced competition allowing the establishment or expansion of sensitive plants. Some sites retain open forest canopies resulting from thin soils and rock outcrops that support limited tree growth.	Amount and quality of habitat has declined significantly due to fire suppression and the resulting increase of woody biomass. On some sites, spotted knapweed encroachment has negatively impacted suitable sensitive species habitat. Increased habitat may have been created as a result of the 2000 fires. None of these species have been found to date in the PSU.
Botrychium ascendens *Botrychium crenulatum* *Botrychium hesperium* *Botrychium paradoxum* *Botrychium pedunculosum* *Corydalis sempervirens*	***Disturbed habitats*** **–** Habitats frequently associated with forest openings, early seral vegetation communities, human activities, livestock use, or in the case of Corydalis, post-fire environments. These sites are often dominated by wild strawberries, *Fragaria*, exotic plants, *Penstemon*, and	Historically, these plant communities occurred in areas of heavy ungulate use, areas impacted by fire, floodplains, avalanche chutes, and other frequently scoured and disturbed habitats.	Suitable habitat has been altered through human activities including road building, cattle grazing, fire suppression, and timber harvest. Cattle grazing along with the development of disturbed roadside plant communities have created more opportunities for these species to flourish. New

Plant Species	Habitat Description	Reference Condition	Existing Condition
	<u>*Brachythecium*</u> mosses.		opportunities may have been created for population expansion resulting from the 2000 fires. Disturbed habitats are common in the PSU. *B. ascendens* has been found within a riparian area in the PSU.
Bryoria subdivergens *Heterocodon rariflorum* *Lycopodium lagopus*	***High elevation / Alpine*** **-** Rocky, alpine and sub-alpine habitats with whitebark pine and subalpine fir krummholz	Other than known locations in the Bitterroot Range and Lincoln County, *Bryoria subdivergens* is only known from the west coast of Greenland. *H. rariflorum* has not been found in Lincoln County, but has been found in neighboring Sanders County on dry rocky benches.	A limited amount of habitat may be available for these species around Robinson Mountain. *B. subdivergens* has only been found around Northwest Peaks area in Lincoln County. *L. lagopus* has only been found in Glacier Nat'l Park to date.
	O	obtain ages in excess and dry u	and li

Plant Species	Habitat Description	Reference Condition	Existing Condition
	fire severity		

***Silene spaldingii* (Spalding's catchfly) and *Howellia aquatilis* (Water howellia)** are listed as threatened under ESA. Additionally, ***Botrychium lineare* (slender moonwort)** once a Candidate species under ESA, was recently removed from listing because it was found to be more abundant than previously known and there is insufficient information to justify its continued listing. All other plant species in **Listed Plants Table 3-1** are listed as "sensitive" for the KNF.

ANALYSIS OF DIRECT AND INDIRECT EFFECTS

Alternative 2

Alternative 2 would have no direct effects on any listed plants within the PSU. Indirect effects are related to the potential impact of fire suppression, as well as wildfire intensity and severity. The KNF is managed under a wildfire exclusion policy. This policy, while established to protect private property, administrative sites, and resources, requires that forest fuels be managed with prescribed fire. Continued build-up of forest fuels, which would occur under Alternative 2, could result in more fires escaping initial attack efforts, burning larger areas of land at higher intensities, and adversely affecting habitat for some listed plant species. Additionally, the policy of fire suppression has allowed the open pine/fir habitats to increase their canopy closure, stem densities and biomass, effectively reducing the habitat available for those listed plant species adapted to these ecosystems. This policy could have long-term adverse effects to listed plant species associated with open pine/fir and meadow habitats.

Effects Common to All Action Alternatives

Individuals or populations of listed plants located away from treatment units would not be affected by any proposed management activities. This includes all known locations of sensitive plants in the PSU. All proposed treatment units (both harvest and prescribed burn only units) have been surveyed for listed plants. To date there has been only one observation of a listed plant species in proposed treatment areas. If additional individuals or populations of listed plants are located in areas proposed for harvest treatment, they would be protected under the provisions of the timber sale contract: Timber Sale Contract Clause C (T)6.251# (Site-Specific Protection Measures for Threatened, Endangered, and Sensitive Species). Also see Management Requirements and Design Criteria, Chapter 2, II-31 and II-32.

Road decommissioning, reconstruction, intermittent stored service, and maintenance are needed to move the existing resource condition toward the desired future condition including: restoring the hydrologic integrity of the watersheds in the PSU; reducing sediment delivery to streams; and providing increased wildlife security. Road maintenance and culvert removal on roads would create micro-site disturbances. These activities could impact individual plant species on a short-term basis, but would not adversely affect species viability for those listed plant species adapted to disturbed habitats.

Alternatives 1, 1M, and 3 have varying degrees of acres targeted for treatment (timber harvest, salvage, post and pole, and prescribed fire fuels reduction). Alternative 1 would treat approximately 7011 acres or 19% of the PSU with various harvest methods (regeneration, intermediate thinning) and fuel reduction by prescribed fire. Alternative 1M would treat approximately 5598 acres or 16% of the PSU and Alternative 3 would treat approximately 5660 acres or 15% of the PSU.

Timber harvest in mature coniferous forest could result in habitat alteration (temporary reduction) for the listed species preferring mature forest in the short-term (40-80 years) until the forest canopy closes in again.

Listed plants preferring riparian forest habitats are only known to occur in a portion of one proposed treatment unit, which would be protected during operations, thus no effects to riparian forest species are likely. Wet forest sites are given special treatment area status, and ground-disturbing equipment would be restricted (See Management Requirements and Design Criteria, Chapter 2, II-31 and II-32).

For listed species preferring open or disturbed habitat sites, Alternatives 1, 1M, and 3 would increase the potential for colonization to occur, particularly where soils are disturbed by ground-based equipment or skid trails. Proposed road decommissioning, intermittent stored service, and maintenance would also benefit these species.

Alternatives 1, 1M, and 3 propose salvage of incidental mortality due to prescribed underburning. Approximately 200 acres (up to 20 acres/year) would be salvaged over the 10 year lifespan of the project. Given adherence to the Management Requirements and Design Criteria, Chapter 2, II-31 and II-32) specific to listed plants, effects to listed plants would be negligible.

Alternatives 1, 1M, and 3 also propose improvement (relocation) of the Robinson Mountain trail to the old South Fork Young Creek Trail #238 and associated parking expansion. This may impact some plant species favoring disturbed areas, but since the old trail prism and existing road turnouts would be utilized, this impact is considered negligible. Likewise, the parking area (approximately one acre) and road relocation (0.4 miles) associated with the proposed boat ramp may also impact some plant species favoring disturbed areas, but again, the likelihood for presence is low and the effect considered negligible given the disturbance (soil compaction) that has already occurred in the area.

ANALYSIS OF CUMULATIVE EFFECTS

SUMMARY OF THE EXISTING CONDITION

Suitable habitat has been altered through human activities including road building, cattle grazing, fire suppression, and timber harvest. Cattle grazing along with the development of disturbed roadside plant communities have created additional habitat for opportunistic species to flourish. Generally however, road construction associated with timber harvest, has likely had the greatest direct and indirect impacts to native plant species. While road prisms have directly altered habitat for some species and created habitat for those associated with disturbed habitats, they have also facilitated human access, including motorized access, which has indirectly impacted native species via introduction of invasive and noxious weeds, which aggressively compete for soil moisture, nutrients and other habitat elements.

Summary of Direct / Indirect Effects of Action Alternatives on Existing Condition

Implementation of Alternatives 1, 1M, and 3 would not result in additional effects to listed plant species because they would not provide an increase in accessibility to riparian areas or special habitats where listed plants are suspected or known to occur based on site surveys. Listed plants are only known to occur in a portion of one proposed treatment unit, which would be protected during operations due to its riparian association. Wet forest sites are given special treatment area status, and ground-disturbing equipment would be restricted (See Management Requirements and Design Criteria, Chapter 2, II-31 and II-32).

EFFECTS OF CURRENT AND REASONABLY FORESEEABLE ACTIONS

The Cumulative Effects Worksheet, located in the Plants section of the Project File, contains the detailed analysis of all past, current, and reasonably foreseeable activities listed in Tables 3-1 and 3-2 (pp III-2 through III-4). All activities identified to occur within the Analysis Area that have the potential to affect the fisheries resource are discussed below.

Vegetation Management and Fuels Reduction Activities

Timber sales associated with completed environmental assessments or impact statements were considered as part of the environmental baseline, except where specific treatment units have not been completed. A more detailed discussion of how past actions have cumulatively impacted this resource has been provided under the 'Existing Condition' column of Listed Plants Table 3-1, above. Plant surveys were conducted for these projects as well as the appropriate biological documentation. If listed plants or critical habitats are located during harvest activities, Timber Sale Contract Clause C(T)6.251# would be applied to modify the activity so that adverse effects would be avoided. No actions would go forward that are found to contribute to the loss of population viability.

Forty acres are planned for fuels reduction as part of the Four Mile Fuels project. The project would benefit listed plant species associated with open forest habitats, such as *Lomatium geyeri* and *Grindelia howellii*. Species associated with disturbed habitats may also benefit from this prescribed burn. Plant surveys will be conducted before these activities occur. Any discovered species would be protected appropriately; therefore these actions would not contribute to the cumulative effect on listed plant species.

Harvest of blowdown salvage is possible in the PSU. Any proposed blowdown salvage would have to be analyzed for listed plant species; therefore no cumulative effects on plants are anticipated.

In some instances, precommercial, intermediate thinning, fuel reduction, and other harvest could contribute beneficially to listed plants of disturbance-prone environments including dry, open forests and meadows. These activities should have little cumulative impacts on species requiring more mature or wet environments as these sites, when found and mapped, are protected from management activities.

Cattle Grazing

According to the District Rangeland Management Specialist, grazing generally occurs along the road edges and within areas recently harvested for timber where grasses are readily available. Based on this information, grazing cattle are unlikely to impact any known locations of listed plants, however, the activity may contribute to the cumulative impact on riparian areas where habitat may be found for some listed plant species.

Noxious Weed Treatment

Listed plants in open, dry forests and meadow habitats are most susceptible to encroachment by noxious weeds because of the habitat preferences that they share. Noxious weeds, including knapweed, are currently known to exist within the PSU. Drier vegetation types are susceptible to noxious weed infestations, especially with ground disturbance. Noxious weeds can out-compete many listed plants for space, light, nutrients, and water. The introduction or spread of noxious weeds would be limited by noxious weed treatment measures. Steps would be taken to avoid treating high probability sites for listed plant species, including not spraying near water.

Fire Suppression

With the direction to suppress all wildland fires on NFS lands, decreases in existing suitable habitats are expected with the additional invasion of Douglas-fir and other woody vegetation into habitat spaces. Invasion would result in increased competition for resources, which could limit the potential establishment and growth of listed plant species in open, dry forests and meadows that require open growing conditions. Fire suppression activities have the potential to affect listed plant sites or populations. Construction of firelines, safety zones, and other control structures could impact individuals on a site-specific basis. Avoidance of these areas would be attempted during suppression efforts but some impacts may still occur. Due to the unpredictable nature of wildfires, contributions of fire suppression to the cumulative effect on listed plant species can only be surmised.

Road Maintenance

Road maintenance activities and administrative use associated with permit administration, data collection, and monitoring of NFS lands are monitored and analyzed for direct effects on listed plant species. These activities are generally confined to roadways. They would not contribute to the cumulative effect on listed plant species since associated habitats are previously disturbed.

Public Use (firewood gathering, hunting, trapping, fishing etc.)

Other forest product activities occurring presently and typically on an annual basis are the gathering of pine cones, boughs and commercial gathering of Christmas trees. These activities occur throughout the PSU, and have little-to-no effect on the landscape and listed plants due to the unspecific nature of the use and the low impact on the resources (foot traffic, hand tools). Additionally, Christmas trees are harvested from existing regeneration units, so this activity would have no cumulative effect on specialized habitats such as old growth and wetlands.

Recreation activities are not expected to contribute to cumulative impacts on listed plants because most activities are confined to roadways where no potential habitat exists. Others are limited in scale and duration and are dispersed activities resulting in very little ground disturbance and a low potential to impact listed plant habitat.

Recreation maintenance

Routine maintenance of trails and dispersed and developed recreation sites would be limited to existing hardened trails and sites. Since these areas have been previously disturbed and most have resulted in soil compaction, there would be no contribution to the cumulative impacts on listed plants.

Special Uses

Operations of outfitter/guides would not result in any change to general and specialized plant habitats (e.g. old growth, riparian areas, rock outcrops, etc.), as they do not involve the harvest of trees. Issuance or re-issuance of special use permits associated with transmission lines, driveways, etc. will require plant surveys prior to approval and will be analyzed at that time in order to avoid additional impacts on listed plant species.

Lands

There are no known land exchanges planned within the PSU at this time. For a discussion of existing private lands, please see below.

Private Property

Home construction and timber harvest may have minor contributions (habitat alteration) to the cumulative impact on listed plant species associated with drier, open and conifer forest types. Otherwise, many of the activities that may occur on the private parcels can only be surmised.

Cattle grazing and activities on private property, two of the current and reasonably foreseeable actions, may have adverse cumulative effects on habitats for listed plant species, but these would not be in association with the implementation of Alternatives 1, 1M, or 3. Activities occurring on the private parcels near Koocanusa Reservoir may have minor contributions to the cumulative effects on listed plant species associated with the drier, open ponderosa and Douglas-fir forest types.

SUMMARY OF CUMULATIVE EFFECTS

The continuation of management actions including timber harvesting and prescribed burning, is likely to have minimal impacts to listed plants. Known locations of listed plants will continue to be protected during the implementation of these activities. Natural events such as wildfires will continue to alter habitat conditions, favoring fire-adapted species over those with less tolerance to early-succession. The opposite will be true in areas where wildfire suppression must occur due to instances of threats to human life and private property. Employment of the Appropriate Management Response (AMR) will assist in future management of the landscape, allowing wildfires to burn under minimal management where those opportunities exist, thus providing pulses of early-successional habitat for associated plant species.

Other activities listed above are likely to have few impacts to listed plants where and when populations are known.

STATEMENT OF EFFECTS

Alternative 2 would have no impact on listed plant species or their habitat because no management activities would occur. Consequences, however, of a no action alternative include eventual loss of habitat for species including *Clarkia rhomboidea, Lathyrus bijugatis, Lomatium geyeri, and Grindelia howellii.* Their habitat may be inadvertently impacted by the continual build-up of ground fuels and invasion by young ponderosa pine and Douglas-fir, except for areas where prescribed burning is planned on big game winter range.

Alternatives 1, 1M, and 3 would have no impact to any listed plant species inhabiting streamside and other riparian habitat. This finding is based upon: 1) no treatment activities occurring in any riparian habitat; and, 2) riparian habitat having existing protective measures under INFS Riparian Habitat Conservation Areas and Montana State Stream Management Zone management guidelines.

Alternatives 1, 1M, and 3 may impact individuals or habitat but, but will not likely result in a trend towards federal listing or reduced viability for listed plant species in coniferous forest habitats. This finding is based upon: 1) low-to-moderate acreage within the PSU having vegetation management treatment (ranging from approximately 19 to 15 percent); 2) timber harvest and resulting habitat modification altering suitable habitat in the short-term (40-80 years) until the forest canopy closes in; and, 3) although only one listed plant observation occurred in the treatment units during the field surveys, suitable habitat is present and individuals could occur in the future.

Alternatives 1, 1M, and 3 may impact individuals or habitat but, will not likely result in a trend towards federal listing or reduced viability for the population or species for plants inhabiting the open pine/fir forest and meadows (*Clarkia rhomboidea, Lathyrus bijugatis, Lomatium geyeri, Mimulus clivicola, and Grindelia howellii*). This finding is based upon: 1) continued fire suppression allowing these forests to increase biomass, increasing the potential for high intensity and high severity wildfire; 2) forest canopy closure and tree encroachment into meadows reducing the suitable habitat of these species over the long-term; and, 3) although no listed plant observations for this type occurred in the treatment units during the field surveys, proposed underburning in the drier habitats would enhance the habitat for these species occurring in open pine/fir forest and meadow habitat.

Alternatives 1, 1M, and 3 may impact individuals or habitat but will not likely result in a trend towards federal listing or reduced viability for the population or species of plants inhabiting disturbed habitats. This finding is based upon the fact that: 1) these species disperse and thrive in disturbed habitats; 2) although no listed plant observations have occurred to date in this type, suitable habitat is present and individuals could occur in the future; and, 3) any management activities in the disturbed habitats from these action alternatives would be site-specific at a very small scale (approximately 1 acre or less).

CONSISTENCY WITH REGULATORY FRAMEWORK

FOREST PLAN DIRECTION

One of the Forest Plan goals is to "Determine the status of sensitive species and provide for their environmental needs as necessary to prevent them from becoming threatened or endangered" (USDA Forest Service 1987a II-1). The sensitive plant analysis for the Young Dodge project considered which species have the potential to occur in the PSU, and assessed the potential effects to listed plants and habitats. Surveys for listed plants in the proposed treatment units were conducted during the 2007 field season. Alternatives 1, 1M, 2, and 3 are consistent with Forest Plan direction.

Another Forest Plan goal is to "Maintain diverse age classes of vegetation for viable populations of all existing native species…" (USDA Forest Service 1987a II-1). Alternatives 1, 1M, 2, and 3 are consistent with this direction via habitat management, both passive and active.

The Forest Plan also supports the protection and maintenance of important riparian zone features where listed plants often exist (USDA Forest Service 1987a II-28 29). Alternatives 1, 1M, 2, and 3 are consistent with the Forest Plan and, as such, are consistent with current Forest Service and federal regulations regarding TES plant species thru adherence to laws, regulations, and policies governing actions in or near riparian habitats.

OTHER LAWS AND REGULATIONS

The Endangered Species Act requires consultation with U.S. Fish and Wildlife Service regarding any major federal action that may affect threatened and endangered plant species. An informal consultation regarding the Young Dodge project involving the project's wildlife biologist and the USFWS occurred on June 14, 2007 and a second on March 5, 2008. There are no other laws and regulations applicable to sensitive plants.

WHITEBARK PINE

INTRODUCTION

Whitebark pine was designated as a sensitive species in the Northern Region, effective December 24, 2011 (Weldon, 2011). Whitebark pine is an important conifer species and serves many vital functions, including snow pack retention, visual aesthetics and forage and habitat values for wildlife. Whitebark pine ecosystems have been declining across much of the historic range due to combined effects of mountain pine beetle epidemics, fire exclusion and exotic blister rust invasion. Because of this decline, the U.S. Fish and Wildlife Service determined listing *Pinus albicaulis* as threatened or endangered is warranted.

REGULATORY FRAMEWORK

On December 18, 2009 the Department of Agriculture issued a final rule reinstating the National Forest System Land and Resource Management Planning rule of November 9, 2000, as amended (2000 rule) (74 FR 242 [67059-67075]). The 2000 rule states: Projects implementing land management plans must comply with the transition provisions of 36 CFR §219.35, but not any other provisions of the planning rule. Projects implementing land management plans must be developed considering the best available science in accordance with §219.35(a). Projects implementing land management plans must be consistent with the provisions of the governing plans. Based on the reinstated 2000 planning rule this project level analysis:

1) Considers the best available science in evaluating the effects on the species and

2) Considers how the action complies with applicable standards and guidelines in the Kootenai National Forest land management plan.

In addition, the analysis considers how the action provides for diversity of plant and animal communities based on the suitability and capability of the specific land area in order to meet overall multiple use objectives, and within the multiple use objectives of a land management plan adopted 16 USC 1604 (g)(3)(B).

In addition Forest Service Manual 2670.5 section 19 defines sensitive species as "those plants and animal species identified by a Regional Forester for which population viability is a concern, as evidenced by:

1) Significant current or predicted downward trends in population numbers or density; or

2) Significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution.

Effects to these sensitive species must be analyzed.The Kootenai Forest Plan (USDA 1987) addresses Sensitive species under its Forest-wide management direction. In its goals it states that we will "determine the status of Sensitive species and provide for their environmental needs as necessary to prevent them from becoming Threatened and Endangered" (Forest Plan p. II-1).

Endangered Species Act

The Endangered Species Act (ESA) of 1973 declares, "… all Federal departments and agencies shall seek to conserve endangered species and threatened species and shall utilize their authorities in furtherance of the purposes of this Act."

USFWS has identified Whitebark pine is a candidate species for listing.

Description of the Forest Plan references for the Project Area

The management areas listed in the Forest Plan where whitebark pine restoration treatments are proposed are in MA2 and MA2og. Management Area 2 is semi-primitive non-motorized recreation (unsuitable timberland). Planned ignitions are: "Acceptable as a means of fuels management and wildlife habitat enhancement. All prescribed fires must be consistent with cavity-habitat management, old growth timber requirements, and applicable soil, air, and water quality."

Effects from Management Area Direction...states in part: "an important assumption in this analysis is that certain management action may contribute or detract from the availability or quality of habitats that support rare plant species."

ANALYSIS METHODS

The analysis area for whitebark pine consists of the Young Dodge Analysis Area. This area is bounded on the north by British Columbia, Canada, and on the west by the Three Rivers Ranger District of the Kootenai NF, and on the east by the Koocanusa Reservoir. The only portion of this analysis area that contains whitebark pine habitat is the higher elevation westernmost portion. Robinson Mountain is the highest point in this area and is in the center of the whitebark pine habitat. The Analysis Area was set as the proper scale to mesh exactly with the Vegetation portion of the Young Dodge project (stand boundaries and database information will be common). An additional reason for the bounds of this analysis are administrative boundaries. British Columbia, Canada to the north and the Three Rivers District of the Kootenai NF to the west.

The assessment for whitebark pine and whitebark pine habitat followed the methods outlined for the Kootenai NF by Leavell and Triepke (1995). Suitable habitats have been identified by published literature and through extensive field experience. Probability of occurrence was estimated, including both historic and existing conditions. The probability analysis took into consideration; past disturbance, locations of known populations, and ecological requirements of the species.

The area within and surrounding Young Dodge Unit 46 was identified as suitable whitebark pine habitat and has high potential for providing restoration opportunities for whitebark pine. Action alternatives are proposed to reverse the downward trends that have led to the whitebark pine's listing.

EXISTING CONDITION AND TRENDS

The recent Region One Whitebark Pine Strategy (2011) – is range wide and references Keane et al 2011 as the primary source documentation for guiding principles and central tenets for the strategy.

Habitat Requirements and Ecology

The following description was adapted from Silvics of North America (1990). Whitebark pine is a slow growing, long-lived tree of the high mountains of southwestern Canada and the western United States. It is of limited commercial use, but it is valued for watershed protection and aesthetics. Its seeds are an important food source for grizzly bears and other wildlife of the high mountains. Whitebark pine grows in the highest elevation forest and at timberline. It grows in a cold, windy, snowy, and generally moist climatic zone. On the Kootenai NF it can also be found on drier southerly exposures at these high elevations.

Whitebark pine cone crops are produced at irregular intervals, with smaller crops and crop failures in between. Clark's nutcracker and red squirrels attack most of the ripening cone crop during August and September. Clark's nutcrackers have an essential role in caching these seeds in the soil. While these seeds help to sustain the Clark's nutcracker, a large proportion of the seed caches go unrecovered and provide the essential means for the tree to regenerate.

Wildfire is an important vegetation recycling force in whitebark pine stands, with historical fire frequencies ranging 35 to 300 years (Fischer and Bradley, 1987). These fires are often fueled by trees killed by the mountain pine beetle. Following disturbances like wildfires that expose mineral soil, the seed can more easily germinate. Prescribed fire is often identified as a restoration treatment.. It is also important to address non-burn treatments such as planting of rust resistant seedlings following prescribed burns or wildfires.

Status of Whitebark Pine

It has been estimated that the Kootenai Forest has about 6,000 acres in the whitebark pine forest type (AMS, 2003). As compared with areas like the Flathead NF or the Gallatin NF, whitebark pine presence on the Kootenai NF is quite limited. Nonetheless, throughout its natural range, concern about the species has arisen because whitebark pine populations have diminished as a result of mountain pine beetle mortality, blister rust infection, replacement by shade tolerant species such as subalpine fir, wildfires, and most recently, climate change. These threats also operate together, increasing the mortality rates in whitebark pine. Competition for light and moisture by encroaching mountain hemlock and subalpine fir can directly impact whitebark pine sustainability. In addition, to the competitive challenges of this in-growth, the dense multistoried condition also makes whitebark pine particularly vulnerable to the effects of wildfires.

Mature stands of whitebark pine are highly susceptible to mountain pine beetle infestation as evidenced by high mortality in the northern Rockies between 1909 and 1940 (Arno, 1989). Since 2000 there has been a substantial increase in mountain pine beetle activity in whitebark pine. (Bentz, 2011)

The principal disease affecting this tree is the introduced blister rust fungus (*Cronartium ribicola*). Blister rust is having a significant effect on populations within northwest Montana as evidenced by survey estimates in Glacier National Park in 1995 and 1996 showing mortality as high as 44%; infestation rates at 70%; and an average of 25% crown kill at that time. (Keane_2001). To address the impacts from white pine blister rust a genetic improvement program aimed at increasing blister rust resistance was established in 2000. The Inland West Whitebark Pine Genetic Restoration Program is modeled after the Northern Region's Western White Pine Program. Some of the highest resistance is found in Northwest Montana with an estimated 56% resistance to blister rust. Research through the program has shown that whitebark pine is genetically diverse with no marked inbreeding, that genetic variation in adaptive traits show moderate to high heritabilities that can respond to selection, that germination in older seedlots are good, and that there is an excellent probability that cost effective rust-resistant seedlings can be produced. (Mahalovich, 2004, 2006, 2011)

The effects from fire suppression - the high levels of fuel accumulation,and successional replacement - cannot be understated. A brief listing of the current and potential losses include (1) loss of potential seed trees, (2) loss of disease resistant trees, (3) loss of whitebark pine regeneration, and (4) losses in proximity to seed sources following extreme wildfire. Fire suppression has been a major factor in the downward trend of whitebark pine on the landscape.

Having adequate seed for the Clark's nutcrackers to cache at distances within 9 mile proximity is viewed as an alternative to, or in conjunction with planting for whitebark pine regeneration. Whitebark pine stands in later structural stages can be a source for cone-producing trees across the landscape and historically Clark's nutcrackers were a major vector for whitebark pine seed dispersal. Understanding the effectiveness of Clark's Nutcracker seed dispersal is as important as having an adequate seed source for determining whether natural regeneration is a viable restoration strategy for whitebark pine. Current research indicates that while Clarks's Nutcracker cached 58% of the collected whitebark pine seeds in whitebark pine habitat; only 16% of those seeds were cached in soil. Of those cached in the soil, most were cached in full sun or in forest litter, where germination success is low. (USDA FS 2011) This low seed dispersal effectiveness, combined with reduced seed production from white pine blister rust and mountain pine beetle stress and mortality suggest that relaying on natural regeneration for whitebark pine restoration may not be a viable restoration strategy. It is concluded that the past management of fire suppression has been a factor in the downward trend of whitebark pine on the landscape.

Description of the Suitable Habitat and Population within the Project Area

Whitebark pine is within the Cold Forest and Subalpine Plant Species Guild. The term "guild" is used to describe a group of species that use similar resources in a similar way. Refer to status of whitebark pine above for a description of the potential threats. There is suitable whitebark pine habitat in the highest elevation portions of the Young /Dodge analysis area. Foresters use the term "plus tree" to designate individual members of a species that have good form, good overall health, and may show resistance to various diseases such as blister rust. Plus trees serve as cone collection locations where seed can be collected and grown in forest nurseries for future planting stock. The Rexford Danger District has not identified whitebark pine plus trees in this area due to accessibility, but this area has been identified as whitebark pine habitat, and has a high probability for whitebark pine restoration. Verification of cone producing whitebark pine stands in the later structural stages across the suitable habitat is generally lacking. Because the landscape level data is not available, the design criteria will include a) pre-survey for whitebark pine; (b) protection of existing whitebark pine during treatment, and, (c) planting after treatment will be considered during development of the site specific treatment prescription. Given the decline of cone producing whitebark pine and the Clarks nutcracker caching behavior, this project will not rely on Clark's nutcracker caching for whitebark pine restoration in Unit 46.

With the exception of unit 46, there is no evidence of whitebark pine occurring within other planned harvest or prescribed burning treatments.

ENVIRONMENTAL CONSEQUENCES

ALTERNATIVE 2 (NO ACTION)

Direct and Indirect Effects

This alternative proposes no management activity. The no action alternative would have no direct effects to whitebark pine, since no activities would occur.

The no action may have indirect effects as it would allow subalpine fir to continue successional development and expand its occupancy of the habitat, which combined with mountain pine beetle and blister rust may directly impact whitebark pine sustainability.

ACTION ALTERNATIVES - ALTERNATIVES 1, 1M AND 3

Alternative 1 and 1M propose prescribed fire (Ecosystem Burn) over 811 acres, and Alternative 3 proposes prescribed fire over 483 acres . The objective is to return fire to stands where it historically maintained more open forest conditions. It would be used to reduce ground and ladder fuels and encroaching understory growth by burning at low-to-moderate fire intensities, similar to those that likely occurred naturally.

This treatment could occur in several different fire regimes. It is used to achieve multiple objectives including, but not limited to, shrub and browse rejuvenation, fuels reduction, and changes in stand density and composition. This treatment typically occurs over large areas. (Ref: p. II-10).

Direct and Indirect Effects

Alternative 1 proposes 376 acres, Alternative 1M proposes 377 acres, and Alternative 3 proposes 256 acres of prescribed burning in Unit 46. The treatment is designed to restore whitebark pine by re-establishing the role of fire in this ecosystem while protecting the residual cone producing whitebark pine.

The treatment alternatives will disrupt the successional development of subalpine fir, reduce it's occupancy of the habitat, which combined with protecting cone producing whitebark pine and potentially planting blister rust resistant seedlings, may directly positively impact whitebark pine sustainability.

Restoring ecosystem health may not directly reduce mountain pine beetle caused tree mortality, particularly while outbreaks are in progress.

Restoration of the natural role of fire may indirectly result in five needle pine ecosystems that are less susceptible to MPB and promote selection resistance to blister rust infections (Schoettle and Sniezko 2007). Management efforts to reduce the effects of MPB, blister rust, and fire exclusion should result in more resilient stands less sensitive to future climate trends…" Restoring ecosystem health may not directly reduce mountain pine beetle caused tree mortality, particularly while outbreaks are in progress. Any surviving cone producing whitebark pine may need additional protection from mountain pine beetle infestation through application of an anti-aggregation pheromone.

CUMULATIVE EFFECTS

Effects of Current and Reasonably Foreseeable Actions

The Cumulative Effects Worksheet, located in the Vegetation section of the Project File, contains the detailed analysis of all past, current, and reasonable foreseeable activities listed in Table 3-2, p III-3. All activities identified to occur within the Analysis Area that have the potential to affect whitebark pine are discussed below:

Vegetation Management and Fuels Reduction Activities

No timber sales, precommercial thinning or other vegetation management activities are planned for whitebark pine habitats other than treatment Unit 46.

Cattle Grazing

Cattle allotments in the Young Dodge analysis area do not extend into whitebark pine habitat. Nor do cows occasionally reach these upper elevation, roadless areas.

Noxious Weed Treatment

No noxious weed treatments in the analysis area are planned for whitebark pine habitats.

Fire Suppression

With the direction to suppress all wildland fires on NFS lands, decreases in existing suitable habitats are expected. These decreases could be caused by continuing encroachment of subalpine fir into whitebark pine habitats. Increasing subalpine fir densities would increase the chances of stand replacement fire occurring, reducing the populations of whitebark pine directly. Construction of fire lines, safety zones, or other fire control related disturbance could impact whitebark pine on a site specific basis. Avoidance of these areas would be attempted during suppression efforts but some impacts may still occur.

Road Management

There are no active road systems located within whitebark pine habitats in the Analysis Area. Therefore road management should have no effect on whitebark pine populations.

Recreation Maintenance

Routine maintenance of trails would be limited to existing hardened trails and sites. Since these sites have been previously disturbed there would be no cumulative effect on whitebark pine.

Special Uses

Operations of outfitter/guides would not result in any change to whitebark pine habitats and they do not involve harvesting trees or clearing sites.

Public Use (firewood gathering, hunting, trapping, fishing, etc.)

Public use activities associated with roads would not occur due to the roadless nature of the whitebark pine habitat within the analysis area. Recreation activities such as hunting are not expected to contribute cumulative effects on whitebark pine because no cutting of trees or altering of habitat occurs.

Private Property

There are no private lands located within or adjacent to whitebark pine habitats. Therefore, no cumulative effects can be expected.

Other Agency

There are no activities planned by other agencies that would occur within the whitebark pine habitats in the Analysis Area. Therefore, no cumulative effects can be expected.

SUMMARY OF CUMULATIVE EFFECTS

Alternative 2

If the No Action alternative is selected and fire is continuously excluded from the analysis area, there could be a negative impact on whitebark pine due to the buildup of natural fuels, increased competition and canopy closure with a resulting decrease in health and vigor, lower cone production and higher susceptibility to mountain pine beetle and blister rust. There would be a decrease in light to the forest floor, and a decrease in naturally occurring open areas that are suitable for whitebark pine germination. In addition, to the competitive challenges of this in-growth; the dense multistoried condition makes whitebark pine particularly vulnerable to the effects of large scale stand replacing fires.

Action Alternatives 1, 1M and 3

Cumulative effects of treatment are essentially limited to the direct and indirect effects discussed above.

DETERMINATION OF EFFECTS

The treatment is proposed to restore fire processes and whitebark pine, and these affects are not expected to threaten the presence or viability of whitebark pine in the project area. The action alternatives are not expected to jeopardize the continued existence of this species.

FUELS

EXISTING CONDITION AND TRENDS

The Analysis Area for fuels is the same as the Decision Area. This analysis will focus on three specific aspects of the fire/fuels resource: fuel types, vegetative response units (VRUs), and fire regime condition class. The measure of effects will be displayed in terms of how the proposed treatments would change these listed parameters within the Analysis Area. Reference conditions are described in the Vegetation and Disturbance Processes section.

FUEL TYPES

Fuel, weather and topography are the three main influences on fire behavior. Forest managers can influence only one of these factors, fuel. By changing the continuity, arrangement, loading, and size classes of fuels present on the landscape we can influence future fire behavior.

There are three kinds of forest fuels – ground, surface, and aerial. Ground fuels include all combustible material lying on the ground or beneath it, such as deep duff, roots, rotten buried logs, and peat. Surface fuels are needles, branches, low growing plants, other woody debris, and dead and dying trees on the forest floor. Aerial fuels consist of shrubs, small trees, and low-growing branches on trees that enable fires to move from the ground to the tree canopy (i.e. ladder fuels). Aerial fuels also include tree canopies consisting of needles and branches.

A buildup of ground, surface, and aerial fuels has occurred in many stands in the Analysis Area due to a combination of natural mortality, disturbance-induced mortality (wildfires, windthrow, and insects and disease), and fire suppression. This has resulted in undesirable fuel arrangement and continuity. Many of the stands proposed for treatment have fuel conditions that warrant treatment at this time. Other stands were treated 15-20 years ago and are in need of a maintenance treatment in order to mimic the natural fire regime. Another class of stands has been treated within the last 10 years and still has fuel characteristics that make them effective at slowing the rate of fire spread.

The following photographs, Fuels Figure 3-1, show examples of fuel types and loads in proposed treatment units. Photograph 1 shows an example of ladder fuels. Photograph 2 shows heavy down fuels. Photograph 3 shows a combination of down and ladder fuels. Photograph 4 shows fuels in a previously treated stand.

Fuels Figure 3-1. Examples of Fuel Loading in Proposed Treatment Units

Photograph 1 Unit 111: Example of ladder fuels

Photograph 2 Unit 216: Heavy down fuels

Photograph 3 Unit 125: Combination of down and ladder fuels

Photograph 4 Unit 4:

Fuels in a previously treated stand

VEGETATIVE RESPONSE UNITS (VRUS)

Refer to MAP 3-3 for a display of the VRUs.

Fire suppression in lower-elevation stands in VRUs 2 and 3 has led to increased densities of small diameter Douglas-fir that is now providing ladder fuels capable of escalating ground fires to crown fires. The moderate-to-high fuel levels in these untreated stands have increased the risk that fire starts may escape initial suppression efforts and become stand-replacing fires, particularly during dry years. These elevated fuel levels pose a risk to those fighting fires, to forest users, and to forest resources. Many of these areas within VRUs 2 and 3 fall within the wildland urban interface (WUI). Access to portions of VRU 2 is limited. The fine, flashy fuels in these areas can spread fire quickly.

Fire suppression in upper-elevation stands (VRUs 5, 7, 9, and 10) has not made as significant an impact as in the lower elevations because of longer fire return-intervals. Although fewer fire cycles have been missed, fire suppression has reduced the natural mosaic of disturbance patterns on these landscapes. Fire starts now have access to a more continuous fuel bed and may create larger patches than were historically present. Insect and disease mortality has also changed this mosaic and increased fuel continuity in higher-elevation stands. Access to some areas of VRUs 5, 7, 9, and 10 is limited. This can delay suppression efforts, leading to the development of large-scale wildfires.

Fire starts from lightning strikes within and outside the Decision Area should continue to occur at historic frequencies. Refer to the map of lightning strikes in the Fuels section of the Project File. Fire starts in VRUs 5, 7, 9, and 10 under dry conditions can lead to large fires, depending on the continuity, arrangement, and loading of forest fuels.

Fuels Table 3-1 contains information on the attributes of the VRUs (USDA Forest Service 1999).

Fuels Table 3- 1.. Fire and Fuels Attributes by VRU

Attributes	VRUs 2 and 3	VRU 5	VRU 7	VRU 9	VRU 10
Reference Fuel Loading	3-15 tons/acre	18-25 tons/acre	25-35 tons/acre	18 tons/acre	7-26 tons/acre
Existing Fuel Loading	5-25 tons/acre	25-35 tons/acre	40 tons/acre (Stands containing lodgepole beetle kill and blowdown may have 50-80 tons/acre)	20-30 tons per acre (Stands containing beetle kill lodgepole and blowdown may have 30- 50 tons/acre)	10-35 tons/acre
Reference Fire Frequency	10-40 years; on wetter sites fires occurred at 25-100 year intervals	Mixed-severity fires every 50-100 years; stand-replacing fires every 100-300 years	Mixed-severity fires every 50-150 years; stand-replacing fires every 100-300 years	Mixed-severity fires every 25-70 years; stand-replacing fires every 120-350 years	Low to mixed-severity fires every 60-300 years; stand replacing fires every 100-300 years
Existing Fire Frequency	Fire occurrences are similar to what happened historically; however the frequencies have been interrupted due to suppression activities	Fire occurrences are similar to what happened historically; fire frequencies have not necessarily changed	Fire occurrences are similar to what happened historically; fire frequencies have not necessarily changed	Fire occurrences are similar to what happened historically; continued suppression will affect fire frequencies over time	Fire occurrences are similar to what happened historically; continued suppression will affect fire frequencies over time
Reference Fire Severity	A mixture of ground fires and stand-replacing fires	A mixture of ground and stand-replacing fires	A mixture of ground and stand-replacing fires	A mixture of ground and stand-replacing fires	A mixture of ground and stand-replacing fires.

Conditions in many portions of VRUs 2 and 3 (Dry Forest) are similar to what would be expected under the reference condition due to the use of timber harvest and prescribed burning in the past two decades. However, the trend in the absence of fire or vegetative management would be toward greater understory development and increases in fuel loading. This could result in a higher portion of stand-replacing fires, rather than low or mixed-severity fires.

Due to the relatively long periods between fires, conditions in some portions of VRUs 5 and 7 (Cool/Moist Forest) are similar to what would be expected under the reference condition. However, some areas are at the upper end of the fire frequency range for both mixed-severity and stand-replacing fires. This information is shown on the fire history map in the Fuels section of the Project File. Fuels in these areas will continue to accumulate until a stand-replacing fire occurs. In VRU 7, fuels will increase in those areas where mortality in lodgepole pine is high and shade intolerant species have established and grown. During extended periods of drought, fires that escape initial attack are likely to escalate into stand-replacing fires.

Conditions in VRU 9 (Cold Forest) are also similar to what would be expected under the reference condition. However, some areas are at the upper end of the range for fire frequency for both mixed-severity and stand-replacing fires. Older stands will accumulate fuels at a faster rate; ladder fuels will also increase. Most fires that escape initial attack will likely become stand-replacing fires. These are generally major events that can consume thousands of acres.

Past treatments in VRU's 5, 7, and 9 have resulted in effective fuel breaks, which slow and limit the spread of large fires. These treatments have removed fuels through harvest and prescribed burning. Past treatments lose their effectiveness through time as stands grow and develop. New harvest units and prescribed burns within these VRU's would provide fuel breaks for 20 to 40 years into the future. These treatments would have similar effects to historic fires by limiting the spread and intensity of fires within the treatment areas. Ecosystem burning can accomplish similar objectives by reducing fuel available for consumption.

Conditions in VRU 10 (Cold/Moderately Dry) are similar to what would be expected under the reference condition. Most fires that escape initial attack will likely become stand-replacing fires. These events can cause extended periods of smoke and limit recreational activities. Some stands within this VRU are within reference conditions for both fuel loadings and fire frequency, while some are on the high end of the ranges. Planned treatments in this VRU would not only benefit fuels reduction objectives, but could create new habitats for threatened species like the grizzly bear. This would happen by reducing competition within existing whitebark pine stands and creating whitebark pine seed beds during burning operations in this VRU.

FIRE REGIME CONDITION CLASS

Existing vegetative conditions have been altered from reference conditions under natural fire regimes. Fire regime condition class (FRCC) has been developed to classify the amount or degree of departure from the historic natural fire regimes (Hann et al 2003). These are broken into three condition classes for each fire regime: FRCC 1 (low departure), FRCC 2 (moderate departure) and FRCC 3 (high departure). More information concerning FRCC follows:

Condition Class 1 – Current conditions of the fire regime are within the historical range of variability; the risk of losing key ecosystem components is low; vegetation attributes (species composition and structure) are intact and functioning within their historical range.

Condition Class 2 – Fire regimes have been moderately altered from their historic range; there is a moderate risk of losing key ecosystem components; fire frequencies have increased or decreased by one or more intervals from their historic range; vegetation and fuel attributes have been moderately altered, resulting in potential changes to one or more of the following: fire size, intensity and severity, and landscape patterns.

Condition Class 3 –Fire regimes have been drastically altered from their historic range; the risk of losing key ecosystem components is high; vegetation has been substantially altered from its historic range; fire frequencies have departed from historic frequencies by multiple return intervals, resulting in dramatic changes to one or more of the following: fire size, intensity, severity, and landscape patterns.

Desired condition within the Young Dodge area is to move a portion of the stands classified as FRCC 3 and FRCC 2 into a lower condition class. This is accomplished through the proposed treatments. Activities in the past two decades have altered a significant number of stands in the low elevation WUI areas to FRCC 1. A portion of those recently altered stands have returned to an FRCC 2 over the years as surface fuels develop. Ingrowth of Douglas-fir and other shade tolerant trees have begun to enter the stands and create ladder fuels.

The existing stand conditions in the Young Dodge Analysis Area (MAP 3-7) have been altered from their reference conditions through two primary historic causes. First, past timber harvest from the mid-century to mid-1980s resulted in high-grading of the stands, particularly in the lower elevations. Second, a century of fire suppression has virtually eliminated fire's natural role in the Analysis Area.

In low-elevation stands, these activities have combined to change species composition and diversity (increasing composition of Douglas-fir), stand ages (younger stands providing more ladder fuel), stand densities (denser stands), and fuel loadings (higher ground, surface, and aerial fuel loads). These conditions have replaced the open, low-density, fire-maintained stands that represent the desired condition. Recent management activities in the lower elevations of the Young Dodge Analysis Area have altered some of these stand conditions by removing ladder fuels; retaining large–diameter, fire-adapted species; and reducing the continuity of canopy fuels. However, since these treatments have occurred, regeneration, fine fuel accumulation, and down woody debris accumulation have caused some of these areas to return to a Condition Class 2.

In some higher-elevation stands, selective salvaging and fire suppression have had similar effects. These activities have changed species composition and diversity (allowing shade-tolerant species), and stand ages (decadent stands that are more susceptible to insect and disease). In the presence of fire on the landscape (FRCC1), higher-elevation stands typically develop mosaic patterns of disturbance, and fire spread is hindered by areas that previously burned. The desired condition is to strategically place proposed treatments on the landscape to provide larger blocks of stands in a similar condition class that would provide viable fuel breaks during a wildfire. Proposed treatment units could develop into more sustainable stands by eliminating surface fuels from post-harvest treatments in parent stands. Larger blocks are developed by placing new treatments adjacent to previously treated stands. Historically, harvested stands have been distributed across the landscape, helping to provide mosaic patterns to impede and restrict fire spread.

FUEL TREATMENTS

The following methods of treating fuels would be used to address the existing conditions described above. A combination of harvest and activity fuel treatments and natural (non-activity) fuel treatments are proposed under the action alternatives.

- These treatments respond to ***Purpose and Need statement A*** (fuel reduction) and relate to ***Strategy 1 (fuel reduction)***.

Timber harvest is proposed to address fuel conditions through the removal of vegetation (as described in Chapter II) to break up fuel continuity across the landscape. These units are often located next to existing, previously-treated openings that create larger patch sizes (see discussion on page III-33 of Vegetation and Disturbance Processes section). Another important factor to consider is prescribed burning following timber harvest. Timber harvest and associated prescribed burning can be effective tools in restoring ecosystem health (Mutch 1994). It has been shown numerous times that manipulation of the forest structure reduces the severity of future wildfire events (Agee 1996; Vihanek and Ottmar 1994). Harvest followed by effective fuel treatments has significantly altered wildfire behavior and spread on the Rexford Ranger District. Examples of these effects can be seen within the area of the 2005 Camp 32 Fire (Appendix 4), within the areas of the 1994 North Fork Fire (Hvizdak 1998), and within the areas of the Lydia and Stone Hill Fires of 2000. The majority of the regeneration stands experienced very little mortality from the fires. Post-harvest treatments also allow new stands to develop without the accumulation of fuels found in stands that naturally regenerate following fires or blowdown events. This lack of post-treatment fuels allows harvested stands to develop in a more sustainable condition over a longer period of time, requiring less management in the future.

Units proposed for fuel treatments without harvest, including those with mechanical pre-treatment, would utilize fire to treat fine fuel accumulations and manipulate the vertical structure of stands. Ladder fuels, density of aerial fuels, and canopy continuity are key characteristics of stand structure that affect the initiation and propagation of crown fire (Albini 1976; Rothermel 1991). Ladder fuels are important because they affect crown fire initiation. Continuity of canopies is more difficult to quantify, but clearly patchiness of the canopy would reduce the spread of fire within the canopy stratum (Powell 2005). Forest treatments that target canopy base heights (i.e. reduce ladder fuels) and bulk density (i.e. reduce canopy continuity) can be implemented to reduce the probability of crown fire (Graham 2004). Typically these treatments are larger blocks by themselves or they can be placed adjacent to existing units, emulating patch sizes that were historically present on the landscape.

FIREFIGHTER AND PUBLIC SAFETY

Cohen (1999) states: "The congruence of research findings from different analytical methods suggests that home ignitability is the principal cause of home losses during a wildland fire." As is stated in Cohen's research, ignitibility may be the principal cause, but it is not the only cause. Due to close proximity of homes to federal land, radiant heat from high-intensity wildfires could cause damage to or ignition of homes despite their ignitibility or lack thereof.

Scott (2003) discusses using not only Cohen's research for a home ignition zone, but also establishing a crown fire free zone (CFFZ). Within the wildland urban interface, firefighters will continue to respond to and suppress initiating fires and establish structure defense ahead of approaching fires. Fuel treatments around structures should be designed to protect firefighters, not structures (Scott 2003). A CFFZ creates an area that will have reduced fireline intensities, flame lengths, and spread rates. This will provide responding forces a safer environment to conduct suppression actions. Treatments in previously untreated stands and maintenance treatments within the CFFZ would create additional safe work environments for fire fighters when placed near existing treatment areas.

A crown fire will loft more firebrands into the air than a surface fire due to the amount and type of fuel being consumed. A crown fire would likely be more intense, thus producing more wind and convective heating. These forces alone or combined will carry firebrands greater distances. Cohen's analysis (modeling, experiments, and case studies) did not explicitly address firebrand ignitions. It is also important to note that no home is totally and completely "fire safe", especially when firebrands can land on or near a home from more than a mile away.

Cohen's research deals directly with home ignitions. It does not attempt to address the issue of public and firefighter safety. There is a significant difference in safety and risk to the public and firefighters when a surface fire and crown fire are compared. Scott's research helps to address these concerns, by mitigating crown fire potential in a greater radius from structures.

ANALYSIS OF DIRECT AND INDIRECT EFFECTS

FIRE BEHAVIOR EFFECTS

In the Young Dodge Analysis Area, fire season typically runs from May through September. During this time, gradual drying of forest fuels occurs throughout the summer. July through August is the peak time of year for thunderstorm development, with lightning being the primary source for fire starts. Human caused fires typically occur during open burning seasons (April, May, October, and November). Fire atlas records from the Young Dodge Analysis Area show that between 1908 and 2005, 108 lightning caused fires and 54 human caused fires have occurred.

Weather variables and fuel moistures change frequently and are the primary factors that affect fire behavior. Fire behavior effects are displayed using two weather scenarios, an average summer day and a critical fire day. Historic weather records collected at the Eureka Ranger Station are used to describe these two scenarios. This weather station is approximately 10 air miles from the Analysis Area. Weather conditions recorded at this station are expected to be similar to the weather conditions observed in the lower elevations of the Analysis Area. Twenty years of weather data were used to compile a record of observations used in this analysis. This weather data was used to predict fire behavior at all elevations, providing a consistent basis for comparison of the alternatives. These weather conditions are used in calculations to predict surface fire behavior using the BEHAVE+ model, and crown fire behavior using the NEXUS 2.0 model.

Average Summer Day: According to historic weather records at the Eureka Ranger Station, an average summer day can be described as: temperature of 90 degrees, light winds at 8 MPH from the west or southwest, and the average monthly precipitation is 1.1 inches in the form of rain, associated with thunderstorms. Relative humidities are measured at approximately fifteen percent. Ten-hour fuel sticks (1/4 to 1 inch in diameter) are measured at five percent fuel moisture content.

Critical Fire Day: According to historic weather records at Eureka Ranger Station, a critical day can be described as: temperature of 97 degrees, strong, gusty winds from the west or southwest at 20-40 MPH, and no significant amount of rain during the previous 4 weeks. Relative humidities are measured at or below twelve percent. Ten-hour fuel sticks are measured at four percent fuel moisture content. These conditions need to be in alignment to constitute a critical fire day. Alignment is the combination of two or more of these variables at the same time.

On an average summer day, as described above, none of the existing conditions modeled in the Analysis Area would produce flame lengths above 5 feet (BEHAVE runs are contained in the Project File). The average day is not usually a concern to firefighters from a personal and public safety standpoint. Fire behavior on average fire days usually allows for direct attack and provides little risk of extreme fire behavior and fire escape. The concern for public and firefighter safety is greatly increased on critical fire days because of the potential increase in fire behavior. It is on critical fire days that the conditions for a crown fire are favorable. In addition to those climatic variables described for a critical fire day, accumulation of dead and down litter, ladder fuels, steep slopes, and a continuous tree canopy also provide favorable conditions for a crown fire (Rothermel 1991).

Fuels Table 3-2 illustrates the existing fireline intensity (FLIN) and crown fire potential compared to the post-treatment setting.

Fuels Table 3-2. Existing and Post-Treatment Fireline Intensities (FLIN)

Units	Existing FLIN	Existing Potential for Crown Fire Initiation?	Post-treatment FLIN	Post-treatment Potential for Crown Fire Initiation?
1, 2, 4, 7, 8, 9, 16, 52, and 111	7163 BTU/ft	Yes	168 BTU/ft	No
5, 6, 10, 13, 14, 24, 46, 47, 103, 110, 112, 120, 211, and 220	1473 BTU/ft	Yes	5 BTU/ft	No
3, 12, 17, 18, 19, 21, 23, 25, 26, 28, 29, 30, 38, 40, 45, 48, 53, 54, 116, 118, 125, 129, 138, 203, 212, 216, 225, and 325,	9972 BTU/ft	Yes	5 BTU/ft	No

The NEXUS 2.0 computer program is used to predict crown fire potential. The model was used to compare existing conditions to expected post-treatment conditions. NEXUS runs are contained in the Project File. For specific information on the Nexus 2.0 model and assumptions see the Project File.

Proposed treatments for this project are designed to reduce wildland fire-intensity, so that it remains a surface fire and does not develop into a crown fire (see Fuels Table 3-2). The Young Dodge project proposes treatments (Units 1, 3, 4, 5, 7, 8, 103, and 111) on federal land that are within the home ignition zone (HIZ), 20 to 60 meters from structures (Cohen 2001). There are very few areas on National Forest System lands that fall within the HIZ, therefore the project proposes treatments (Units 1, 2, 3, 4, 5, 6, 7, 8, 10, 47, 52, 53, 103, 111, 112, 211) in the CFFZ, that would give an additional margin of safety to residents, firefighters, and forest users. There is some overlap between the HIZ and CFFZ due to unit size and the location of structures on the private land boundaries.

The purpose of the proposed treatments is to reduce dead and downed fuel accumulations, eliminate or reduce ladder fuels, and increase spacing between tree canopies. New treatments would accomplish all of these aspects, while maintenance burns would reduce regrowth and needle litter since the last treatment. This would significantly reduce or eliminate the potential for a surface fire to transition into a crown fire or sustain a crown fire initiated outside the treated stand in all treatment areas, as the NEXUS program clearly displays. Proposed treatments would restore more natural fire regimes that historically occurred in the Analysis Area.

There are many local, site-specific examples that showcase the effectiveness of the proposed fuel treatments and their ability to keep fires on the surface or transition a crown fire back to the surface. The 2005 Camp 32 Fire, on the Rexford Ranger District, is a prime local example. See Appendix 4 for information regarding the Camp 32 Fire.

It is important to note that the intent of fuel treatments planned for Alternatives 1, 1M, and 3 is not to fireproof the Decision Area. Rather, these treatments would have an effect on the behavior of fires that may ignite in or burn into the treated stands during the next 10-20 years.

ALTERNATIVE 2

As there is no timber harvest or prescribed burning proposed in Alternative 2, there would be no change from the existing condition. Many of the stands in the Decision Area are in a condition conducive to stand-replacing fire. If a fire were to escape initial attack suppression efforts and burn into the extensive fuel accumulations, especially during dry, windy conditions, it would likely burn with high rates of spread and high intensities. With the ladder fuels that exist in many of the stands, fire would easily reach the crowns and become a stand-replacing crown fire. Such a fire would result in the loss of valuable resources and could threaten landowners, Forest users and visitors.

EFFECTS COMMON TO ALL ACTION ALTERNATIVES

In Alternatives 1, 1M, and 3, fireline intensities would be reduced as described in Fuels Table 3-2 above. Also refer to Behave+ and NEXUS model runs in the Fuels section of the Project File. Fires could still spread rapidly in the ponderosa pine (VRU 2 and 3) types, as they are composed of fine flashy fuels. Fires would still ignite, but would burn with lower intensities due to the reduction of ground and ladder fuels. As a consequence, suppression forces would have a much better chance of controlling fires. Stands treated with timber harvest and prescribed burning would be effective in reducing fire effects for a number of years, depending on tree species: approximately 15-30 years in ponderosa pine types, 40-70 years in Douglas-fir types, and 60-100 years in the higher-elevation lodgepole and subalpine fir types (Hvizdak 2003). These proposed treatments are “refreshing” previous treatments, or adding more area of defensible space around the West Kootenai community.

Road decommissioning would have no effect on fire suppression response times, as these roads were identified as not being needed for future management. This determination was made by the ID Team and access for fire suppression was one major consideration during this process.

Intermittent stored service would have little to no effect on fire suppression because there are other roads in close proximity. This determination was made through the same process described above for road decommissioning.

Alternatives 1, 1M, and 3 propose salvage of incidental mortality due to prescribed burning. Approximately 200 acres (up to 20 acres/year) could be salvaged for the 10-year lifespan of the project. The salvage of dead and dying trees would reduce future fuel loads in the units and would have a beneficial effect on the fuel arrangement, continuity, and loadings.

Alternatives 1, 1M, and 3 propose relocating the trailhead for the Mt. Robinson Trail (#59), currently located on Road #999. The work would consist of reconstructing 0.5 miles of the old South Fork of Young Creek Trail #238 and constructing an area for parking at the new trailhead. One and a half miles of the current trail on Road #999 would be abandoned and the road would be placed into intermittent stored service. Effects on fire and fuels would be negligible as few-to-no trees would be harvested and access to the area would still be possible.

Alternatives 1, 1M, and 3 propose to build a boat ramp in Young Creek Bay. This project would require clearing approximately one acre of land. These trees would need to be piled and burned, eliminating approximately one acre of fuel from the Analysis Area. This would have short- and long-term beneficial effects on the fuel arrangement, continuity, and loadings in this area.

Alternatives 1, 1M, and 3 propose to renew 22 special use permits within the Analysis Area. These permits generally have very little effect on fuel resources due to the lack of activity that generates or rids the forest of fuels. Right-of-way clearing is one activity that could produce fuels, and these fuels are required to be burned by the permittee, resulting in beneficial effects to the fuel arrangement, continuity, and loading in this area.

EFFECTS OF ACTION ALTERNATIVES

Alternative 1

Alternative 1 includes fuel treatment on approximately 6932 acres. The proposed harvest units are well located to manage areas that are a high priority for fuel treatment (see MAP 2-1). These include stands with moderate-to-high fuel loads. Many of the units, except Units 27 and 220, are located adjacent to stands that were previously treated, which would create larger patch sizes that would serve as effective fuel breaks against wildfires burning in from adjacent, untreated stands.

Blowdown can be expected along the edges of some of the higher-elevation regeneration units, which would result in increasing levels of ground fuels. Residual trees remaining in the treated stands should be fairly windfirm, but some may blow over.

Alternative 1M

Alternative 1M includes fuel treatment on approximately 6478 acres. This alternative is very similar to Alternative 1, with the exception that some units were removed (Unit 129) and the silvicultural prescriptions were altered on some units (see MAP 2-3). Changes in the silvicultural prescriptions (Units 12, 17, 19, 21, 25, 29, and 38) would have little effect on the results of the post harvest fuel treatment. In all treated stands, actions would result in lowered crown fire potential, and reduced ladder and surface fuels. The total treated acres are reduced from Alternative 1, therefore this alternative would have a reduced effect on the potential for fire behavior in site-specific portions of the Project Area.

Alternative 3

Alternative 3 includes fuel treatment on 5608 acres. The proposed harvest units are well located and are of an effective size to treat areas identified as high priority. Units 17, 19, 23, 25, 30, and 40 were reduced in size to meet MA 12 Fish and Wildlife Standard #7. Additionally, Units 5, 13, and 14 and portions of Units 3, 10, 103, and 111 were dropped from consideration in this alternative as they were located in old growth stands. Some of the units dropped from consideration are adjacent to private property and lie within the WUI boundary. These units contain continuous fuels. The fewer and smaller harvest units in this alternative do not treat existing fuels and create fuel breaks as well as Alternative 1. Harvest units located in isolated patches do not create fire breaks. This was evident during the summer of 1994 on the Rexford Ranger District when numerous large fires occurred (USDA 1995c 99). Fire effects in these smaller units are reduced, but fire spread outside the unit is not changed because the continuous fuels around them are not a deterrent to fire spread or intensity.

Blowdown can be expected along the edges of some of the higher-elevation units, and would likely be more evident than in Alternative 1, as there would be more edges and leave strips available to wind flows. This would result in increasing levels of ground fuels.

The Purpose and Need to reduce fuel accumulations and increase patch size would not be met as effectively under Alternative 1M, 2, or 3 as with Alternative 1.

CUMULATIVE EFFECTS

The Cumulative Effects Worksheet, located in the Fuels Section of the Project File, contains the detailed analysis of all past, current, and reasonably foreseeable activities listed in Tables III-1 and III-2 in Chapter III. All activities identified to occur within the Analysis Area that have the potential to affect the Fuels resource are discussed below. Cumulative effects are the result of all the impacts past, current and reasonably foreseeable activities have on a resource. The results of past activities are described in the section titled "Summary of Existing Condition" below. The anticipated effects from proposed activities were added to the existing condition and described in the section titled "Summary of Direct and Indirect Effects of the Action Alternatives on the Existing Condition". Then the impacts of current and reasonably foreseeable actions are added to the effects described in the direct and indirect effects section below. The sum of all these effects is the cumulative effects. The Analysis Area considered for cumulative effects was the same as the Project Area.

Summary of the Effects of Past Actions on the Existing Condition

Past actions have led to the current situation for fuels. Vegetation management, fuels treatments, wildfire, road construction, and cattle grazing have created fuel breaks, decreased fuels, and reduced down fuels accumulations across the landscape. Alternatively, in some portions of the Analysis Area, fire suppression and inactivity have led to the opposite; continuous fuels, accumulations of surface fuels and in-growth of shade tolerant trees.

Summary of Direct and Indirect Effects of the Action Alternatives on the Existing Condition

Alternative 1 would add 6932 acres of fuels treatments to the landscape within the Analysis Area. This would add to the network of fuels treatments that have occurred in the past and revitalize some that occurred within VRUs 2 and 3 that are losing their effectiveness within the WUI. Large blocks in the upper elevations would be created by incorporating new and old treatments to increase fuel breaks which would limit and slow fire spread. Low elevation treatments would increase the opportunities for fire fighters to safely suppress fires around the West Kootenai community and provide access and egress for firefighters, local residents and forest users.

Alternative 1M would add 6478 acres of fuels treatments to the landscape in the Young Dodge Project Area. This alternative is similar to Alternative 1, but would have fewer effects due to fewer treatment acres. Fewer large blocks would be created in the higher elevations, thus limiting the effectiveness of fuel breaks that are created by the activities.

Alternative 2 would not add any new vegetative or fuels treatments to the Analysis Area. This includes both new units and road activities. This alternative would not change the condition of the fuels in the Analysis Area in the short term. However, in the long term it would continue to have an effect on the ability of fires to spread. Crown fires would be more prevalent as treatments to reduce fire size and intensity have not occurred.

Alternative 3 would add 5608 acres of fuels treatments to the Project Area. This alternative is similar to Alternatives 1 and 1M, but would have even fewer beneficial effects and an increasing number of undesired effects due to fewer treatment acres.

EFFECTS OF CURRENT AND REASONABLY FORESEEABLE ACTIONS

Vegetation Management and Fuels Reduction Activities

Trends in fuel reductions brought about by management activities, such as regeneration harvest, are limited to the implementation area. Generally speaking, fuels and the potential for fire have been reduced in harvest units (regeneration and intermediate). At the same time, fuel accumulations in unmanaged stands have increased over time as a result of fire suppression, insects and disease, and forest succession. Therefore, there are significant disparities in fuel patterns between unmanaged stands and regeneration harvest units, with little gradation between. Where forests have been commercially thinned intermediate conditions exist.

Cumulatively, regeneration and intermediate harvest and activity/natural fuel reduction techniques would continue to reduce fuels and the associated risk of wildland fire within and outside of the wildland urban interface. These stands would be more resistant to insects and disease and be able to better withstand low-to-moderate intensity wildfires over time. The overall cumulative trend would be improvement in forest health conditions as continued management moves stands toward desired future conditions.

Salvage of blowdown trees may occur within the Analysis Area. If salvage occurs, the appropriate analysis will be conducted. Treatments may be applied to an estimated 20 acres in any year. These small sales would reduce fuels in site specific areas of the Analysis Area.

Approximately 2000 acres of precommercial thinning is scheduled for the Young Dodge area for 2012-2019. This would help create vigorous stands of trees composed of a desirable mixture of tree species. These stands would be able to better withstand low-to-moderate intensity wildland fires over time.

Approximately 109 acres of commercial thinning is scheduled for 2012 or 2013 for the Young Dodge area. This treatment would favor ponderosa pine, thinning the stand to a spacing of 12 to 25 feet. Activity-generated fuels would be hand or excavator piled and burned at a later time. This treatment would reduce the ladder fuels in the stand and help reduce the risk of a fire moving from the ground into the crowns within this stand.

Approximately 109 acres of commercial thinning is scheduled for 2012 or 2013 for the Young Dodge area. This treatment would favor ponderosa pine, thinning the stand to a spacing of 12 to 25 feet. Activity-generated fuels would be hand or excavator piled and burned at a later time. This treatment would reduce the ladder fuels in the stand and help reduce the risk of a fire moving from the ground into the crowns within this stand.

Past prescribed burning on National Forest lands has been tracked through the timber stand database. Effects of prescribed burning were incorporated into the cumulative effects analysis through consideration of the effects disclosed in the Young Dodge FSEIS and a review of the timber stand database. Application of prescribed fire would decrease the amount of fuels available for consumption, consequently decreasing the possibility of undesirable effects associated with wildfire impacts. Ecosystem burning would contribute cumulatively to reducing the fuel accumulation and maintain the fire cycle in the Project Area.

Cattle Grazing

Past grazing activities on National Forest land have been tracked through the range database, the range allotment plan, and the 1998 West Kootenai and Boulder/Scalp Mountain Grazing EA/DN. Past range activities on State and private lands have been tracked, in part, by the range database.

The West Kootenai Allotment encompasses the Project Area. Recent average use of this allotment has been around 180 cow/calf pairs from May 15 to September 30. The 1998 West Kootenai and Boulder/Scalp Mountain Grazing EA, which follows Forest Plan direction, provide guidance for the management of this allotment.

Cattle grazing within the allotment have not contributed to a reduction of fuels in the majority of the Young Dodge area. In some areas in the lower elevations, where grasses are the primary carrier of fire, cattle grazing would have a seasonal beneficial effect on reducing the available fuel for fire spread. In high elevation stands, grasses are not the primary carriers of fire and grazing would have an indiscernible effect. Because grasses are annual vegetation, there would be no cumulative effects on the fire/fuels resource from this activity.

Very little grazing occurs on State and private lands. From personal experience, trends in livestock grazing appear to be stable. The findings of this assessment conclude that ongoing and reasonably foreseeable grazing activities within in the Young Dodge project area would cumulatively contribute indiscernible effects to the fire/fuels resource.

Noxious Weed Control

The control of noxious weeds is a more recent activity. The control of noxious weeds is tracked by project accomplishment reports. It was assumed that the control of noxious weeds on private and state lands is an infrequent activity.

Noxious weed control on National Forest land is an ongoing activity that normally occurs during the summer months. The Kootenai National Forest Invasive Plant Management EIS/ROD provides direction for weed control on the District. Noxious weed control is expected to continue over the next ten years. Weed control helps maintain native and desirable forage species.

Effects of noxious weed control were incorporated into the cumulative effects analysis through consideration of the effects disclosed in the Kootenai National Forest Invasive Plant Management EIS and ROD, a review of the project database, and professional judgment and personal knowledge of noxious weed control. The findings of this assessment conclude that noxious weed control within the Project Area would not contribute to an increase or reduction of fuel loading.

Noxious weed control on State and private lands is considered an infrequent activity. With the amount of noxious weed control on private and state lands, potential effects to fire/fuels would be indiscernible.

Fire Suppression

The exclusion of wildfires from stands that are historically dependent upon wildfire would contribute to an increase in fuel loading. Dead and down fuels would continue to accumulate and allow vigorous undergrowth of small tree thickets, providing ladder fuels that could accelerate initiation of crown fires in forest stands. Fire suppression activities have a cumulative effect on fuel loading.

Road Management Activity

Road maintenance on National Forest land has been an ongoing activity for many years. More recent road maintenance information has been tracked through the road database. It is assumed that similar maintenance on State and private lands results in similar baseline conditions.

Road maintenance is an ongoing and reasonably foreseeable activity on National Forest land throughout the Young Dodge area. Road maintenance activities include road blading, gate replacement/repair, installing/replacing culverts, placement of aggregate, brushing, debris removal, and other activities. It is expected that the amount of road maintenance would remain stable over the next ten years.

Effects of road maintenance were incorporated into the cumulative effects analysis through a review of the road database; the list of BMPs associated with road work, and professional judgment and personal knowledge of road maintenance procedures. Road maintenance is also completed on roads where vehicle access is restricted. The findings of this assessment conclude that ongoing and reasonably foreseeable road maintenance activities within the subunit would cumulatively contribute indiscernible changes in fire/fuels conditions. No significant changes in road maintenance are expected over the next ten years. Road maintenance can facilitate the treatment of fuels through access for harvest or prescribed fire.

Road maintenance on State and private lands is considered an infrequent activity and follows Best Management Practices. With the limited amount of road maintenance on private and state lands, potential effects on fire/fuels would be indiscernible.

Special Uses

Special use permits are tracked through a special uses database. Most of the ongoing permits within the Young Dodge Analysis Area involve transmission lines (phone and power), Rights of Way, and road permits. Most of the transmission lines follow road prisms. Associated activities with these permits include maintenance work, noxious weed and vegetation control. Additional permitted uses include collection of forest products, outfitting/guiding, and the use of gravel from established pits. These activities occur at a low use level.

Effects of special use permits were incorporated into the cumulative effects analysis through a review of the special uses database and professional judgment and personal knowledge of special use permits within the Analysis Area. The majority of these activities related to special use permits would have no discernable effects on fire/fuels.

The level of special uses within the Analysis Area is not expected to change much over the next ten years.

Public Use (firewood gathering, hunting, trapping, fishing, etc.)

Firewood cutting has an annual effect on forests within 200 feet of roads open yearlong and seasonally. Larch and Douglas-fir are the preferred species; however, due to the high demand and scarcity of available cutting areas, lodgepole pine and other dead species are also removed. This activity has the potential to reduce coarse woody materials, snags, and fuel up to 200 feet from roads. It is difficult to know how many acres within the Young Dodge area have been affected by this activity. Firewood cutting would continue to occur near open roads.

Hunting, fishing, trapping, and other recreational pursuits have little effect on fuels within the Analysis Area. Other than camp fires, few activities either create or rid the forest of fuels.

Private Property

Development has been occurring for the last century in the Analysis Area; however, it has been most active in the last two decades. Private land inholdings have been subdivided and sold in the recent past. It is expected that new home construction would continue. The vegetative conditions on private land are highly variable and range from grassland to dense forest. Private land development has converted some forested land to low-density forest or grassland and roads. In most cases, the desire of landowners has been to maintain a forested setting in the immediate vicinity of dwellings and structures that is contiguous to forested public lands.

Other Agency

Commercial thinning and salvage of blowdown would reduce the fuels on State Trust and MFWP lands within the urban interface. Prescribed burning is not expected to occur on State Trust or MFWP lands within the Project Area in the next ten years. These activities would tend to improve the condition of the fuels resource provided that follow up fuels treatment is done following vegetation management activities. In general these activities would reduce down woody fuel accumulations, reduce ladder and aerial fuels, and create fuel breaks. Both of these other agency lands lie within the wildland urban interface boundary.

CUMULATIVE EFFECTS FINDING

There are cumulative effects associated with past actions, as these have contributed to the current state of the fuels resource. Past vegetation management across the Analysis Area has resulted in a change in down woody accumulations, ladder fuels, and the location of fuel breaks. In general this has been a positive change, trending the area toward a historical condition. However, actions such as fire suppression have let portions of the Project Area trend toward a worsening condition class with closed canopies, increased ladder fuels and accumulations of surface fuels. There would be cumulative effects both positive and negative from vegetation management and fuels reduction activities, cattle grazing, fire suppression, road management, special uses, public use, private property, and other agency actions in association with Alternatives 1, 1M, 2, and 3. The cumulative effect of the past, proposed, current, and reasonably foreseeable actions is that as new activities occur there is a change in the current condition. In most cases the action is the basis for an improved condition of fuels across the landscape. Inaction trends the area toward a condition that sustains and propagates undesired fire intensities and effects. All the listed actions would not "fire proof" the Analysis Area, but would instead create barriers to fire spread through fire breaks, prescribed burning, and other vegetation management.

CONSISTENCY WITH REGULATORY FRAMEWORK

FOREST PLAN DIRECTION

Alternatives 1, 1M, and 3 would be consistent with the following Forest Plan goals: "Use prescribed fire to simulate natural ecological processes, prevent natural and activity fuel buildups, create habitat diversity for wildlife, reduce suppression costs, and maintain ecosystems" and "Protect Forest users, property and resources from wildfire" (USDA Forest Service 1987a II-2). Alternative 2 would not be consistent with those goals.

STATE LAW

State of Montana Control of Timber Slash and Debris Law - Alternatives 1, 1M, and 3 would be consistent with the following Montana State Law that requires logging slash be reduced to acceptable state standards (Title 76 Chapter 13 Part 4). Alternative 2 would also be consistent as it does not propose any harvest activities; therefore no slash treatment actions are necessary.

OTHER LAWS AND REGULATIONS

There are no other laws and regulations applicable to fuels.

AIR QUALITY

INTRODUCTION

Smoke produced from the prescribed burning of timber harvest residue and natural fuels can have an adverse effect on air quality. Smoke production can be influenced by the type and timing of burning, amount of available fuel, as well as weather conditions. The same factors that influence the amount of smoke produced by wildland fires influence the smoke produced by prescribed burning. Methods of slash treatment and site preparation other than prescribed burning are available. However, most of these alternatives require costly equipment, can cause excessive soil disturbance, do little to remove the slash, provide inadequate site preparation, and do not restore fire into the ecosystem.

ANALYSIS AREA

The Young Dodge Project Area totals approximately 37,882 acres. This amount includes 32,601 acres of Federal ownership and 5281 acres of private and State of Montana ownership. The Project Area roughly lies south of the Canadian border, east of Robinson Mountain and Red Mountain, west of Koocanusa Reservoir and north of Clingback Mountain. This Project Area is located in the northwest corner of the Rexford Ranger District. The Young Dodge Project Area is partially within the wildland urban interface and entirely within Airshed 1 (one of ten airsheds monitored by the Montana/Idaho Airshed Group). The Analysis Area for air quality is expanded from the Project Area to include sensitive areas downwind. Air quality in this area is generally good and does not exceed predetermined levels of suspended particulate matter, with only minor impacts occurring during open burning season in spring and fall. Most emissions from prescribed burning, wildfires, and dust within the Project Area are dispersed downwind in an east to northeast direction by prevailing west and southwest winds. Sensitive areas downwind (1-15 miles) include the communities of West Kootenai, Rexford, Eureka, and the Tobacco Plains area. There is a designated impact zone (area of special concern for particulate impacts) around the community of Eureka, approximately 4 miles to the east and southeast. These local areas would experience some impact from smoke when burning within the Young Dodge Project Area. Most of the impact would be from the settling of smoke into the lower valley bottom areas during the night and early morning hours and would be of short duration. Other sensitive areas within the Analysis Area include the communities of Libby, Kalispell, and Whitefish and the Class I areas of Glacier National Park and the Cabinet Wilderness.

Under the 1977 amendments to the Clean Air Act (42 U.S.C. 7401 et seq), areas of the country were designated as Class I, II, or III airsheds for Prevention of Significant Deterioration purposes. Class I areas generally include national parks and wilderness areas. Class I designation provides the most protection by severely limiting the amount of additional human-caused air pollution that can be added to these areas. The Cabinet Mountain Wilderness area to the south of the Decision Area, and Glacier National Park and the Bob Marshall Wilderness to the east, are Class I airsheds. The remainder of the KNF and the portion of the Flathead National Forest are classified as Class II airsheds. A greater amount of additional man made air pollution may be added to these areas. No areas on the KNF have been designated as Class III at this time.

The Tobacco Valley area has experienced smoke for many decades, both from wildfires and prescribed fires. Since the advent of fire suppression, smoke from wildfires was gradually reduced until the mid-1980s. However, smoke from wildfires in 1988, 1994, 2000, and 2003 impacted the area significantly for several weeks at a time. The smoke from these wildfires was uncontrolled and unregulated.

Road dust is a source for particulates during dry periods in summer and fall in forested areas. This source of particulates is not limited to summer months though, as the area can also be impacted to a certain extent as road surfaces dry in winter. Pollution from this source is generally localized as the dust usually settles within close proximity of the road itself.

MEASUREMENT INDICATORS

The combustion products of smoke from wildland fires and prescribed burning include carbon dioxide, water vapor, carbon monoxide, particulate matter, hydrocarbons, nitrogen oxides, and trace minerals. This analysis will focus on particulate matter. Federal and State ambient air quality standards have been established for particulate matter (PM), which is the pollutant of most concern from smoke. The effects of smoke from prescribed burning are reduced visibility and increased levels of small diameter particulates, specifically PM2.5 (less than or equal to 2.5 micrometers) and PM10 (less than or equal to 10 micrometers). These are of concern for human health reasons, particularly PM2.5 which is smaller and tends to be inhaled deeper into the lungs where it is much harder to expel. Most of the PM10 particles that are inhaled are trapped in the mucus membranes of the nose and throat.

If a community does not meet or "attain" the National Ambient Air Quality Standards, it is designated as a non-attainment area and must demonstrate to the public and the Environmental Protection Agency how it will meet standards in the future. This demonstration is done through the State Implementation Plan. There are three non-attainment areas within the Analysis Area, Libby, Whitefish, and Kalispell.

In July 1997, the EPA issued revised national air quality standards for ozone and particulate matter in the 2.5 micron class (PM2.5). The EPA proposed the following implementation plan for the new standards that took effect on September 18, 1998:

- Nationwide fine particulate monitors in place.
- States and EPA collect data from nationwide network.
- States submit to EPA their State Implementation Plans (SIPs) describing how they will meet and enforce the new standards.
- States implement their Plan to assure they attain the standards.

The current Federal and State standards are:

- **PM_{10}:** 1) the concentration of PM_{10} must not exceed 150 micrograms per cubic meter over a 24-hour period; or 2) the annual arithmetic average must not exceed 50 micrograms per cubic meter.
- **$PM_{2.5}$:** 1) the concentration of $PM_{2.5}$ must not exceed 65 micrograms per cubic meter over a 24-hour period; or 2) the annual arithmetic average must not exceed 15 micrograms per cubic meter.
- Particulate Matter PM_{10} and $PM_{2.5}$ monitors are located in Libby, Kalispell, Whitefish, Missoula, Helena, and several other sites in Montana.

REFERENCE CONDITIONS

Although there is no historical air quality data for the natural ecosystems in Airshed 1, it is known that fire historically played a major part in the vegetative conditions of the area. Journals from early day explorers and newspaper articles from the late 1800s often mention the smoky conditions from fires burning in western Montana and northern Idaho (Losensky 1992). Numerous fire scars and mosaic patterns of disturbance are evidence of large-scale stand-replacement fires. It is likely that generally hazy conditions were common during summer through autumn, and that locally heavy accumulations of smoke occurred near wildfires. Outside influences on the local airshed include dust and smoke from areas to the west.

Prescribed burning on National Forest System lands began sometime around 1950. Since that time, the local area has experienced smoke from prescribed burning annually. However, it is unlikely that the amount or duration of smoke is anywhere near what occurred naturally before suppression efforts began early in the century. Unlike post settlement burning, today's prescribed burning is scheduled by forest managers to take place during periods of good smoke dispersal and is of short duration, normally burning to extinction or manually extinguished within a few days. At no time has smoke from prescribed burning impacted the local residents with the same intensity and duration that occurred from wildfires.

EXISTING CONDITION

Monitoring conducted by the Montana Department of Environmental Quality have demonstrated that prescribed burning of logging slash, when burned in compliance with State regulations, is not a major contributor to reduced air quality in Lincoln county. Source apportionment studies taken in Kalispell, a nonattainment area, have shown that slash burning contributes less than three percent of the total PM_{10}, with material from road dust, gravel roads, parking lots and construction activities being the major contributors (MT DEQ 2009). PM_{10} readings taken in Libby since 1988 have shown a trend in improving air quality during the months of September through November when most of the prescribed burning takes place. The readings taken from air quality monitors in Kalispell show the greatest impacts to air quality during the winter months, with spikes during the summer (See reports in Air Quality section of the Project File). The potential impacts of smoke from prescribed burning have been minimized through successful airshed coordination.

Air quality monitoring in Eureka by the Montana Department of Environmental Quality has shown that air quality is fair to good and particulate levels are typically within the standard of 150 micrograms/cubic meter. The monitoring unit in Eureka was removed in 1992 because data showed that Eureka did not have an air quality problem. This would indicate that the monitoring program operated by the Montana Airshed Group is working successfully to limit burning to times when good dispersal can occur.

When the air quality monitoring equipment was in place, the particulate levels in Eureka exceeded the National standard of 150 micrograms/cubic meter only once between 1988 and 1991. This was due to the Dry Forks Wildfire that burned on the Forest during September of 1988. This is indicative of the potential degradation in air quality that large-scale wildfires may cause.

According to the 1996 Environmental Protection Agency's Report AP-42, *Compilation of Air Pollution Emission Factors*, some air pollution is generated by prescribed burning, although the net amount is believed to be a relatively smaller quantity than that produced by wildfires. The Environmental Protection Agency (EPA) states in this report that "prescribed fire is a cost-effective and ecologically sound tool for forest, range, and wetland management. Its use reduces the potential for destructive wildfires and thus maintains long-term air quality."

EPA's air quality monitoring unit operates throughout the year but is most active during the open burn season, issuing restrictions on burning due to air quality in the fall and recommendations for burning in the spring. Spring and summer months are generally considered excellent for smoke dispersal due to normal strong wind patterns. Fall months also have good to excellent dispersion due to air movement, though periods of air stagnation do occur and restrictions are issued. The winter months of December through February are closed to all open burning unless absolutely necessary due to the high occurrence of cold air inversions that result in poor smoke dispersal. Since the monitoring system only issues recommendations during the spring and summer months, restrictions are done voluntarily by the District or Forest if it appears that smoke from all sources has the potential to become an impact. For more information regarding airsheds and the smoke monitoring unit, see the Air Quality section of the Project File.

Airshed 1 air quality is influenced predominantly by smoke and dust originating from areas to the west because the general windflow for the airshed is from this direction. This includes smoke from grass burning on the Rathdrum and Palouse Prairies, located between Sandpoint and Lewiston, Idaho, as well as other agricultural areas in Washington and northern Oregon. Industrial emissions, and those from internal combustion engines, add to the level of regional haze and air pollution load. Prescribed burning of logging residue by private and other government entities adds wood smoke to the air mass. Wildland fires burning as far west as the coastal range of Oregon and Washington also contribute to air quality degradation. Dust originating from tilled farm land during dry windy weather can add to local haze and reduce air quality.

The mountainous topography of the Analysis Area influences the smoke dispersal. Smoke produced at higher elevations is nearer the free air winds that occur at and above ridge tops, so dispersion is usually better than at lower elevations. Conversely, smoke produced at lower elevations is more likely to be affected by valley inversions and must rise farther to enter the free air wind. Prescribed burns and wildfires on south exposures are more likely to be affected by local thermal winds than those on north slopes. Prescribed burns and wildfires on slopes exposed to the prevailing wind would have better smoke dispersion than those located on the lee slope.

Smoke produced within the Analysis Area from wildland fires and prescribed burns would most likely be carried in an easterly direction by the predominantly westerly, synoptic scale, windflow pattern that influences western Montana.

Air quality is also affected by dust produced by vehicle traffic, including logging trucks, especially on native surface (non-aggregate) roads. The amount of dust produced is influenced by the silt content of the road surface layer, the distance traveled, the weight and speed of the vehicle, as well as weather conditions. Aggregate-surfaced roads produce a relatively smaller amount of dust than do native surface roads, especially during dry weather.

DESIRED FUTURE CONDITION

The Forest-wide objectives for air quality are 1) to maintain excellent air quality on the Forest and protect local and regional air quality by cooperating with the Montana Air Quality Bureau in the Prevention of Significant Deterioration (PSD) program and State Implementation Plan (SIP), and 2) to prevent long-term deterioration of the air quality, classified as Class I for Glacier National Park and Class II for the rest of the Forest. Requirements of the PSD, SIP, and the Montana Smoke Management Plan would be met.

ANALYSIS OF DIRECT AND INDIRECT EFFECTS

Prescribed burning is proposed in Alternatives 1, 1M, and 3 in this project. This burning, depending upon the prescription and implementation, would have varying effects to air quality. These effects can be generalized as follows.

Excavator piling and subsequent burning of those piles produces the least amount of smoke. Dense fuels optimize flaming combustion and there is less smoldering than in larger-scale burns. Smoke impacts would be for a short duration, but fall inversions may have localized smoke impacts to the West Kootenai area.

Ecosystem and maintenance burns are landscape-scale burns done in the absence of timber harvest. These burns are ignited in a controlled manner to influence heat and smoke production, while protecting the residual stand. Smoke impacts from this Analysis Area generally last a few days and are noticeable in the Tobacco Valley and sometimes Grassmere, British Columbia areas.

Compared to the other methods, underburning of logging slash generates the most smoke. Smoke produced during burning is generally lofted high enough to avoid the West Kootenai area and generally misses the Eureka area. Nighttime inversions or poor smoke dispersion affect these areas to a greater degree as residual fuels burn out and smoke settles into the cool valley bottoms. These effects often last 1-3 days following an underburn.

MITIGATION MEASURES TAKEN TO REDUCE PRESCRIBED BURNING EMISSIONS

Because one of the objectives of prescribed burning is to reduce the threat of wildfires, burning itself is a smoke mitigation measure. The smoke from prescribed fire can be managed to a degree, whereas the smoke from wildfires is unmanageable. The amount of smoke emissions resulting from prescribed burning of both natural fuels and activity fuels would be mitigated by four general methods: fuel loading reduction, fuel consumption reduction, flaming combustion optimization, and impact avoidance. For more information on these mitigation measures see the Air Quality section of the Project File.

RISK OF REDUCED AIR QUALITY FROM NATURAL EVENTS

The incidence of air quality impacts from natural events is unpredictable. However, the amount of smoke generated per acre from a burning wildfire would be greater than from a prescribed fire. Research estimates the average wildfire PM10 emissions in forest types to be 30 pounds/ton of fuel consumed (USDA 2001; Hardy and Einfield 1992; Ward et al 1989). More green material (live crowns) is burned during a wildfire, which is not very efficiently consumed. Also, an uncontrolled wildfire will burn into the nighttime hours when smoke dispersal is generally poor. Air quality impacts from a wildfire would normally occur during the summer months when visitor use in the affected airsheds is the highest.

ALTERNATIVE 2

Alternative 2 does not propose any prescribed burning of harvest activity fuels or naturally occurring fuels. There would be no direct effect to the air quality of the Analysis Area from the implementation of this alternative. However, Alternative 2 would not reduce fuel loadings. Wildfire ignitions in or adjacent to the Analysis Area could escape initial attack efforts and burn into unmanaged stands. This would result in indirect effects to the air quality of the communities and sensitive areas downwind in an easterly direction of the Analysis Area, because prevailing westerly winds are a dominant feature. If such a fire were to burn in the typical lodgepole or western larch/Douglas-fir stands found in the Analysis Area, PM2.5 and PM10 would be produced, resulting in reduced visibility.

The closest sensitive area downwind is West Kootenai, Montana, which is within the Analysis Area. The west side of the Eureka Impact Zone, as defined by Montana DEQ, is within four miles of the Analysis Area. Refer to the Air Quality section of the Project File for a map of the Impact Zone.

Smoke from wildfires is unmanageable and would likely exceed that produced by the prescribed burning contained in Alternatives 1, 1M, and 3.

Dust would not be produced from timber harvest and related activities, including yarding, log hauling, and road maintenance. It would still be produced during administrative use, and use by forest visitors, but these activities would be associated with general forest management and not this project.

EFFECTS COMMON TO ALL ACTION ALTERNATIVES

The direct effects of prescribed burning on air quality in the Analysis Area would be an increased level of small diameter particulates, specifically PM2.5 and PM10, and a reduction in visibility. However, the effects to the Impact Zone and sensitive communities downwind would be slight because the timing of ignition of prescribed burns is regulated by the Montana/Idaho Airshed Group. The group looks at the current and expected forecast for mixing winds for smoke dispersion in determining which prescribed burns to approve.

The populated local area (approximately 10 miles away) would experience little, if any, impact from smoke.

Smoke settling down-drainage and onto Koocanusa Reservoir may move north under an extended high-pressure system. Short periods of smoke concentration may occur in the local area adjacent to the prescribed burn unit during night and early morning inversions following the day of ignition. Diurnal heating and mixing would disperse smoke as the inversions break in the early morning and mixing continues throughout the afternoon hours. Residual smoke production from large logs, stumps, and piles would be expected for several days.

Dust would be produced from timber harvest and related activities, including yarding, log hauling, and road maintenance. It would also be produced during administrative use, and use by forest visitors. It is impossible to quantify the amount of dust that would be produced by each of the alternatives. However, dust can be addressed through the inclusion of Timber Sale Contract CT5.31#_T-103 (dust abatement solutions) or placement of aggregate in timber sale contracts.

Other activities including the boat ramp, trail reroute, special use permits generally have immeasurably low effects on air quality. Except the construction of the boat ramp, which would create some dust for two to three days in the local area, these activities typically do not produce any air pollutants that would affect air quality.

EFFECTS OF ALTERNATIVES

Prescribed Burning

The estimated amount of smoke emissions produced by prescribed burning associated with the alternatives is portrayed in the following table. Smoke from fuel treatment is related to fuel loading. Existing fuel loading in timber harvest units is expected to range from 20 to 68 tons per acre. To best meet resource objectives, approximately 25 tons per acre of material 3 inches and greater in diameter would be left on-site for regeneration harvests. Average fuel loads consumed would be an estimated 30 tons per acre for harvest units and 10 tons per acre for non-harvest ecosystem, maintenance, and piled units. For harvest units where slash would be disposed of by piling and for roadside fuel reduction units, a figure of 25 tons per acre was used. Smoke emission factors can be used to predict PM2.5 and PM10 emissions released during slash disposal. This is displayed in Air Quality Table 3-1 below. Worst-case scenario conditions for particulate calculations include estimates for particulates released during all phases of combustion. The Project File contains the calculations used to develop these estimates.

Air Quality Table 3-1. Particulate Amounts Produced by Prescribed Burning Associated with All Activities

	Underburns/Harvest (Acres)	Excavator Piles (Acres Burned)	Underburns (Acres-Post Pile Burning)	Maintenance Burns (Acres)	Eco-Burns (Acres)	Total Acres	Particulate Totals (tons)	Totals for Alternatives (tons)
Alternative 1 (Acres)	**2535**	**1145**	**1958**	**1236**	**811**	**7685**		
$PM_{2.5}$	715	155	98	62	41		1071	**2268**
PM_{10}	780	177	117	74	49		1197	
Alternative 1M (Acres)	**2115**	**1130**	**1946**	**1236**	**804**	**7231**		
$PM_{2.5}$	596	153	97	62	40		948	**2012**
PM_{10}	650	175	117	74	48		1064	
Alternative 2 (Acres)	**0**	**0**	**0**	**0**	**0**	**0**		
$PM_{2.5}$	0	0	0	0	0		0	**0**
PM_{10}	0	0	0	0	0		0	
Alternative 3 (Acres)	**2420**	**739**	**1077**	**1236**	**483**	**5955**		
$PM_{2.5}$	682	100	54	62	24		922	**1949**
PM_{10}	744	115	65	74	29		1027	

The effects of prescribed burning for each action alternative are directly related to the acres of timber removed and the amount of associated activities that would take place. The effects of smoke from prescribed burning are reduced visibility and increased levels of small diameter particulates, specifically $PM_{2.5}$ and PM_{10}. These are of concern for human health reasons, as previously stated.

Air Quality Table 3-2 shows the factors that would influence the effects of smoke from prescribed burning in the Analysis Area on sensitive areas (non-attainment communities, Class I airsheds, and other local communities).

Air Quality Table 3-2. Factors Influencing Effects of Smoke on Sensitive Areas

Area of Concern	Transport wind direction to location of potential impact	Distance to area of concern in miles	Percent Probability of wind direction occurrence: May (Spring)	Percent Probability of wind direction occurrence: September (Fall)
West Kootenai, MT	SW	0	17.0 %	16.4 %
Libby, MT, Nonattainment area	NE	38	3.0 %	3.8 %
Whitefish, MT, Nonattainment area	NW	50	4.2 %	5.8 %
Kalispell, MT, Nonattainment area	NW	64	4.2 %	5.8 %
Eureka/Rexford, MT	NW	8	4.2 %	5.8 %
Cabinet Mt. Wilderness, Class I Airshed	NE	42	3.0 %	3.8 %
Glacier National Park, Class I Airshed	W	50	13.1 %	14.6 %

The information in Air Quality Table 3-2 indicates that transport winds would carry smoke from the Analysis Area toward Glacier National Park 13.1% of days in the spring and 14.6% of days in the fall. If prescribed burning occurs on one of these days, smoke has the potential to impact visual quality and deliver airborne pollutants to this Class I airshed. The effects of visual impairment would be less noticeable during spring weather because park use is very limited then due to deep snow. The overall probability of impacting the air quality of Glacier National Park is considered to be low because of the distance from the Analysis Area, and the amount of time smoke has to disperse.

The table also depicts that the community of West Kootenai would be impacted between 16% and 17% of the potential burn days. This community lies on the northeastern portion of the Analysis Area and has the potential to be the most impacted by smoke. However, residents would also have the greatest benefit when comparing a managed scenario to a wildfire scenario (see Air Quality Table 3-3).

Fire intensities, fuel moisture levels, and utilization of the flaming phase of combustion would all be monitored and used to reduce particulate production and airshed impact. By burning under optimum conditions, particulate amounts would be drastically reduced as compared to amounts generated by a wildland fire of the same acreage. $PM_{2.5}$ and PM_{10} levels would rapidly disperse as they are carried by local and general winds.

All action alternatives would generate $PM_{2.5}$ and PM_{10}. Amounts of particulates are directly proportionate to the amount of acres treated and to the treatment methods used. As Air Quality Table 3-1 shows, the amounts of particulate released varies by treatment due to time spent in the smoldering combustion phase. These amounts can be reduced by timing ignition of treatments to coincide with periods of optimum fuel curing.

There would be no direct effects to the air quality or human health from Alternative 2 as no prescribed burning activities would be implemented. Reduced visibility and small diameter particulates would not be produced. Decadent stands with downed material combined with ladder fuels from the developing shade-tolerant understory not treated through mechanical treatments and/or prescribed burning would act as a fuel source for a wildfire. Smoke from wildfires is unmanageable and would likely produce smoke in intensity and duration much greater than what would be produced from planned ignitions in any of the action alternatives. This is the indirect effect of Alternative 2.

Wildland Fire

For analysis purposes, it was assumed that all the acres proposed for timber harvest/fuel treatment in Alternatives 1, 1M, and 3 are burned by intense, stand-replacing wildland fire. Stand-replacement fire would produce the highest volume of particulates; therefore, it is used here as a worst-case scenario. In doing this, a basis for comparing the potential air quality impacts of wildland fire to the potential impacts of management activities is derived. Air Quality Table 3-3 displays these estimates. A value of 50 tons per acre was used for fuel consumed in this exercise. This is not an attempt to depict reality, but merely an analysis for comparison purposes.

Air Quality Table 3-3. Particulate Amounts Produced by Managed Versus Wildland Fire

Alternative	Acres	$PM_{2.5}$ in Tons	PM_{10} in Tons	Totals
Alternative 1 (Managed)	7685*	1071	1197	**2268**
Alternative 1 and 2 ** (Wildfire)	6932	3258	3553	**6811**
Alternative 1M (Managed)	7231*	948	1064	**2012**
Alternative 1M (Wildfire)	6478	3045	3320	**6365**
Alternative 3 (Managed)	5955*	922	1027	**1949**
Alternative 3 (Wildfire)	5608	2636	2874	**5510**

*Alternatives 1, 1M, and 3 (Managed) depict a greater number of acres than Alternatives 1, 1M, and 3 (Wildfire) due to some areas under the managed scenarios being excavator piled and burned with a follow up underburn.

**Alternative 1 (Wildfire) acreages are used to depict a wildfire scenario for Alternative 2.

The potential amount of smoke produced would vary by alternative and would be proportionate to the amount of fuel hazard reduction resulting from each alternative. The greatest degree of reduction of wildland fire potential through fuel hazard reduction would occur from the implementation of Alternative 1, while the least amount would occur with Alternative 2.

The comparison of relative impacts from implementing an action alternative versus experiencing a stand-replacement wildland fire indicates that, on an acre-to-acre basis, an action alternative would produce 67 percent fewer particulates than an intense wildland fire affecting the same area.

Wildland fire occurrence, intensity, and size would be similar to fires in the recent past, thus producing similar impacts to air quality. Historic records from 1908 to 2005 show that 54 human caused fires and 108 lightning caused fires occurred within the Analysis Area. These fires are generally kept small through fire suppression, burning less than one acre each. However, there is an increasing probability that one of these fires would escape initial attack and grow to several hundred or several thousand acres and burn for several days or weeks. The Young J Fire, within the Young Dodge Planning Area started on August 15, 2000 and grew to 825 acres. Fires of this scale and duration would impact air quality to varying degrees while the fire is active.

Implementation of Alternative 2 would also affect wildland fire smoke by the gradual change in the existing fuel complexes as dead woody fuels accumulate secondary to insect, disease, and weather disturbance. Live fuels, especially ladder fuels, would also increase over time as stand density becomes greater and shade-tolerant species begin to grow in the understory. As the fuel loadings increase, the incidence and intensity of wildland fires, and the smoke they produce, would increase.

Design Criteria pertaining to prescribed burning have been developed to address air quality concerns. Refer to page II-34.

CUMULATIVE EFFECTS ANALYSIS

The Cumulative Effects Worksheet, located in the Air Quality Section of the Project File, contains the detailed analysis of all past, current, and reasonably foreseeable activities listed in Tables III-1 and III-2. All activities identified to occur within the Analysis Area that have the potential to affect the Air Quality resource are discussed below. Cumulative effects are the result of all the impacts that past, current, and reasonably foreseeable activities have on a resource. The results of past activities are described in the section titled "Summary of Existing Condition" below. The anticipated effects from proposed activities were added to the existing condition and described in the section titled "Summary of Direct and Indirect Effects of the Action Alternatives on the Existing Condition". The impacts of current and reasonably foreseeable actions are then added to the cumulative effects. The Analysis Area considered for cumulative effects was the same as that considered for the direct effects analysis.

Summary of the Effects of Past Actions on the Existing Condition

There is very little effect from past actions on this resource. Effects to the existing air quality condition are directly affected by the time period when the activity occurs. Activities that could cumulatively effect air quality must occur during a relatively short time period (generally weeks). Past activities may have occurred in relatively close spatial locations but if they do not occur within the same time period then they have no significant cumulative effect.

Summary of Direct and Indirect Effects of the Action Alternatives on the Existing Condition

Alternative 1 would add approximately 2268 tons of particulate matter to the atmosphere during the life of the project. This is in addition to fugitive road dust that occurs annually within the Project Area. Prescribed burning, wildfires, and other dust generating activities occur annually on private and other agency lands, however, there is have no way of quantifying the effects of these activities.

Alternative 1M would add approximately 2012 tons of particulate matter to the atmosphere during the life of the project. This is also in addition to fugitive road dust and private and other agency activities that may occur within the Project Area.

Alternative 2 would not add any management generated particulate matter to the atmosphere. There is an increased likelihood of wildfire smoke impacting the Analysis Area under this alternative, due to fuel conditions across the landscape. Fugitive road dust and activities on private and other agency lands would still occur. These activities would cause some effects to the air quality resource.

Alternative 3 would add approximately 1949 tons of particulate matter to the atmosphere during the life of the project. This is also in addition to fugitive road dust and activities on private and other agency lands witihin the Project Area.

EFFECTS OF CURRENT AND REASONABLY FORESEEABLE ACTIONS

Vegetation Management and Fuels Reduction Activities

The cumulative effects on air quality from prescribed burning smoke produced as a result of the implementation of an action alternative would result in an incremental decrease in air quality as $PM_{2.5}$ and PM_{10} particulates from this source are combined with other particulates from local and upwind regional sources. Prescribed burning of logging slash on other federal land would also contribute particulates.

General wind patterns may cause smoke to drift into Glacier National Park and the Flathead Valley. Visibility may be temporarily reduced while prevailing weather influences mixing and smoke dispersal. The condition can also produce visual benefits such as vivid sunsets and sunrises. Effects would be minimized in the spring because of fewer park and forest visitors, higher fuel moistures that allow for fewer emissions, better smoke dispersion, and reduced impacts from other PM_{10} producing activities.

With the current Douglas-fir bark beetle infestations, there is the potential for small salvage timber sales over the next ten years. Blowdown salvage sales may occur with some associated pile burning that would result in an increase in particulates.

Approximately 109 acres of commercial thinning would be conducted in 2012 or 2013. Activity fuels are expected to be hand or machine piled, with pile burning occurring at a later date. Piles are estimated to have 25 tons/acre of fuel consumed. Pile burning emits fewer particulates than wildfires or underburning due to more complete combustion. This activity would increase particulate emissions; however, emissions would still be managed under the Montana/Idaho State Airshed Group on a daily basis.

Vegetation management occurring on private lands would result in some pile burning in the spring and fall. Private burners are under the same airshed allowances as the Forest Service. The Montana/Idaho State Airshed Group determines how much particulate matter is allowed into any given airshed on a daily basis.

Prescribed Burning without Harvest - The cumulative effects on air quality from prescribed burning smoke produced as a result of the implementation of an action alternative would result in an incremental decrease in air quality as $PM_{2.5}$ and PM_{10} particulates from this source are combined with other particulates from local and upwind regional sources. Other prescribed burning on federal lands would also contribute particulates.

General wind patterns may cause smoke to drift into Glacier National Park and the Flathead Valley. Visibility may be temporarily reduced while prevailing weather influences mixing and smoke dispersal. The condition can also produce visual benefits such as vivid sunsets and sunrises. Effects would be minimized in the spring because of fewer park and forest visitors, higher fuel moistures that allow for fewer emissions, better smoke dispersion, and reduced impacts from other PM_{10} producing activities.

Other burners are under the same airshed allowances as the Forest Service. The Montana/Idaho State Airshed Group determines how much particulate matter is allowed into any given airshed on a daily basis.

Cattle Grazing

Past grazing activities on National Forest land have been tracked through the range database, the range allotment plan, and the 1998 West Kootenai and Boulder/Scalp Mountain Grazing EA/DN. Past range activities on State and private lands have been tracked, in part, by the range database. The West Kootenai and Boulder/Scalp Mountain Grazing EA, which follows Forest Plan direction, provide direction for the management of this allotment. Cattle grazing within the allotment have not contributed cumulatively to air quality impacts. Very little grazing occurs on State and private lands. The findings of this assessment conclude that ongoing and reasonably foreseeable grazing activities within the Young Dodge Project Area would not contribute cumulative effects to air quality.

Fire Suppression

The cumulative effects of wildland fire smoke on air quality would include all pollution sources contributing particulates to the air mass in addition to the smoke produced by wildland fires within the Analysis Area. The greatest cumulative effect would occur when wildland fires are burning outside and upwind of the Analysis Area and wildland fires within the Analysis Area burn at the same time. The cumulative effect of these sources could result in extended periods of poor air quality.

Road Management Activity

The cumulative effects on air quality of road activities such as road blading and brushing produced as a result of the implementation of one of the action alternatives and routine road maintenance would result in an incremental decrease in air quality as $PM_{2.5}$ and PM_{10} particulates are increased for a short period of time. Other vehicle traffic and industrial sources would also contribute to the cumulative particulate loading.

Public Use

Fugitive road dust is created as a result of motorized vehicle use when road surfaces are dry. When a motorized vehicle travels on an unpaved road, the force of the wheels moving across the road surface causes surface material to pulverize. Dust is lofted by the rolling wheels as well as by the turbulence caused by the vehicle itself. This air turbulence can persist for tens of minutes after the vehicle passes. This occurs any time the public uses a road for a variety of reasons, and is an ongoing situation during most seasons.

The moisture content of the road surface has the greatest influence on the amount of fugitive dust produced. Roads are generally closed by snow during the winter months within the Young Dodge Analysis Area. Dust associated with timber harvest and related activities would be addressed through provisions in timber sale contracts specifying the application of dust abatement solutions or the placement of aggregate. Most dust production would occur during the dry months of July, August, and September. Limited precipitation does fall during these months, but usually would only reduce dust production, not eliminate it. Dust levels can be expected to return to pre-rain levels within three to seven days.

Special Uses

Special use permits are tracked through a special uses database. Most of the ongoing special use permits within the Young Dodge Project Area involve transmission lines (phone and power), Rights of Way, and road permits. Almost all the road permits in the Project Area involve roads open to the public. Most of the transmission lines follow road prisms. Associated activities with these permits include maintenance work, noxious weed and vegetation control. Additional permitted uses include the collection of forest products, outfitting/guiding, and the use of gravel from established pits. These activities occur at a low use level.

Effects of special use permits were incorporated into the cumulative effects analysis through a review of the special uses database and professional judgment and personal knowledge of special use permits within the Project Area. The findings of this assessment conclude that special uses within the Young Dodge Project Area would cumulatively contribute indiscernible effects to air quality. The numbers of special uses within the Project Area are expected to continue at similar levels over the next ten years.

Activities on Private Land

Smoke associated with burning on private land can also be expected to occur. While the District has no control over burning that takes place on private land, the conditions resulting from these sources would be taken into effect when determining whether to ignite proposed burns.

Private land development has been occurring for the last century in the Analysis Area; however, it has been most active in the last two decades. Pile burning is expected to occur on MT DNRC and MFWP lands within the Young Dodge Analysis Area during the next ten years. Private inholdings have been subdivided and sold in the recent past. It is anticipated that this process would continue. The vegetative conditions on private land are highly variable and range from grassland to dense old forest. Private land development has converted some forested land to low-density forest or grasslands and roads. In most cases, landowners have desired a forested setting in the immediate vicinity of dwellings and structures contiguous with forested public lands. However, with ongoing prevention efforts some landowners have begun to mitigate the risk of wildfire around their homes by thinning their property.

Other Agency

MFWP plans to commercially thin approximately 50 acres in the next five years. This activity will most likely have pile burning associated with it. This activity will be monitored by the Montana/Idaho Airshed Group.

Road maintenance on State and private lands is considered an infrequent activity and follows Best Management Practices. With the limited amount of road maintenance on private and state lands, potential effects on air resources would be indiscernible.

CUMULATIVE EFFECTS FINDING

There are cumulative effects associated with past actions, as these have contributed to the current state of the air quality resource. Past management within the Project and Analysis Areas have contributed particulate matter to the atmosphere however this material has dispersed beyond the effective range of this analysis. There would be cumulative effects, both positive and negative, from all management actions or lack thereof. Activities (Alternatives 1, 1M, and 3) from this planning effort would contribute a known amount of particulate matter to the atmosphere. However, inaction (Alternative 2) would lead to a state of worsening fuels conditions, which in turn leads to a greater probability of wildfire activity. As shown in the Effects Analysis, the particulate matter distributed to the atmosphere under a wildland fire scenario creates greater effects

CONSISTENCY WITH REGULATORY FRAMEWORK

FOREST PLAN DIRECTION

The Forest Plan objectives for air quality are to “Maintain the excellent air quality on the Forest,” “Protect local and regional air quality by cooperating with the Air Resources Management Bureau in the Prevention of Significant Deterioration (PSD) program and State Implementation Plan (SIP),” and “Prevent long-term deterioration of the air quality, classified as Class I for the Cabinet Mountains Wilderness, and Class II for the rest of the Forest” (USDA Forest Service 1987a II-6).

By participating in the Montana State Airshed Group, complying with the Memorandum of Understanding with the Air Resources Management Bureau, and meeting the requirements of the State Implementation and Smoke Management Plans, Alternatives 1, 1M, and 3 would be consistent with the Forest Plan objectives and the Clean Air Act. Alternative 2 does not contain any fuel reduction treatments and the likelihood of a fire escaping initial attack and escalating into a stand-replacing fire is increased, along with the related adverse impacts on air quality. Alternative 2 would not be consistent with the Forest Plan objective.

OTHER LAWS AND REGULATIONS

There are no other laws and regulations applicable to air quality.

WATER

INTRODUCTION

This section outlines the results of the analysis for the physical aspects of the Water Resources in the Young Dodge Analysis Area. The biological aspects of the water resource are addressed in the Fisheries Section.

No significant aquatic issues were identified for Water Resources during the scoping process. Therefore, law, regulation, and policy drive effects analysis, specifically:

- Compliance with the Clean Water Act and Protection of Beneficial Uses;
- Compliance with Protection of Riparian and Wetland Areas; and
- Compliance with Forest Plan Standards.

REGULATORY FRAMEWORK

The regulatory framework pertaining to Water Resources is summarized below. For additional information, please refer to the Soil and Water Project File.

STATE AND FEDERAL LAWS AND REGULATIONS

The Clean Water Act (CWA) established Federal water quality policies, goals, and programs. Both the Environmental Protection Agency (EPA) and the States have responsibility for carrying out the CWA. The objective of the Act is to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters."

Section 313 of the Clean Water Act requires Federal agencies to comply with all Federal, State, interstate and local requirements, administrative authority, processes, and sanctions with respect to control and abatement of non-point sources of water pollutants.

Section 404 of the Clean Water Act authorizes the Secretary of the Army (operating through the Army Corps of Engineers) to issue permits for the discharge of dredged or fill material into wetlands (33 CFR 323). Silvicultural activities are exempt from the 404-permit process, as are associated roads if constructed and maintained using Best Management Practices (BMPs) (Federal Register 323.4(a), 7/91). Potential effects on wetlands will be analyzed and disclosed. If a practical alternative to affecting a wetland exists, the wetland will be avoided (40 CFR 230.1).

The authorities governing Forest Service water management are:

- The Multiple-Use Sustained-Yield Act of 1960 – states that management of the National Forests must provide sustained yields without impairment of the productivity of the land.
- The Forest and Rangelands Renewable Resources Planning Act of 1974 (as amended by the National Forest Management Act of 1976), Section 5 – directs the Secretary of Agriculture to use a systematic, interdisciplinary approach to achieve integrated consideration of physical, biological, economic, and other sciences in National Forest land and resource management planning.
- Clean Water Act, Section 313 – requires Federal agencies to comply with all Federal, State, interstate and local requirements, administrative authority, processes, and sanctions with respect

to control and abatement of non-point sources of water pollutants. This requires the Forest Service to apply all reasonable land, soil, and water conservation practices, or specialized Best Management Practices (BMPs).

Water quality in the Analysis Area is currently managed through the application of BMPs. The use of BMPs is the foundation for meeting water quality standards in the State of Montana. This is documented in ARM 16.20.603, which states that, "land management activities must not generate pollutants in excess of those that are naturally occurring, regardless of the stream's classification." Naturally occurring, as defined by the ARM is the water quality condition resulting from runoff or percolation over which man has no control or from developed lands where all 'reasonable' land, soil, and water conservation practices (BMPs) have been applied. BMPs are considered reasonable only if beneficial uses are protected.

The Clean Water Act also requires states to establish water quality standards that allow for the protection of designated beneficial uses, and to identify waterbodies that do not meet these standards, called ‘water quality limited segments’ (WQLS). A WQLS is a waterbody that is not fully meeting water quality standards or is not fully supporting its intended uses.

The Montana Streamside Management Zone Law and Administrative Rules (HB 731 1995) establishes a system for classifying streams and determining widths of Streamside Management Zones (SMZs) and allowable activities within them. This law works in combination with Inland Native Fish Strategy (INFS) (described below under ‘Forest Plan Direction’). In most cases, INFS Riparian Habitat Conservation Areas (RHCAs) specify a wider buffer than State mandated SMZs. A document summarizing the State SMZs, INFS RHCAs, and the Kootenai National Forest Riparian Guidelines can be found in the Soil and Water Project File.

The SMZ Law also prohibits the following practices in SMZs:

- Broadcast burning (does not apply if forest products are not being harvested);
- The operation of wheeled or tracked vehicles except on established roads;
- Clearcutting;
- The construction of roads except when necessary to cross a stream or wetland;
- The handling, storage application, or disposal of hazardous or toxic materials in a manner that pollutes streams, lakes, or wetlands or that may cause damage or injury to humans, land, animal, or plants;
- The side-casting of road material into a stream, wetland, or watercourse; and
- The deposition of slash in streams or other waterbodies.

Any deviations from the SMZ Law require an Alternative Practice Permit from the Montana Department of State Lands.

Executive Order 11988, Floodplain Management directs that each agency shall provide leadership and shall take action to reduce the risk of flood loss, to minimize the impacts of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains in carrying out its responsibilities for: acquiring, managing, and disposing of federal lands and facilities; providing federally undertaken, financed, and assisted construction and improvements; and/or conducting federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulation, and licensing activities.

Executive Order 11990, Protection of Wetlands Order directs that each agency shall provide leadership and take action to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands in carrying out the agency's responsibilities for: acquiring, managing, and disposing of federal lands and facilities; providing federally undertaken, financed, and assisted construction and improvements; and/or conducting federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulation, and licensing activities.

FOREST PLAN DIRECTION

Objectives

Construct the minimum number of roads necessary to permit the efficient removal of timber and mineral resources. Construct and reconstruct roads only to the minimum standards necessary to prevent soil loss, maintain water quality, minimize safety hazards for a reasonable and prudent Forest user, and provide access for fire protection where needed to meet Management Area goals (USDA Forest Service 1987b #2).

Meet or exceed State Water Quality Standards (USDA Forest Service 1987a p II-2 #19).

Ground-disturbing activities such as road construction, road reconstruction, and timber harvest will be accompanied by mitigating measures to prevent or reduce increases in sedimentation and stream channel erosion. The amount of harvest allowed will depend on the rate of hydrologic recovery after timber has been removed (USDA Forest Service 1987a p II-7).

Municipal watersheds will be managed to provide current stream flows and keep water quality at current levels (USDA Forest Service 1987a p II-7).

Standards

Those activities or standards that will prevent or reduce stream sedimentation will be implemented along with the soil and water conservation practices specified in Forest Service Handbook (FSH) 2509.22. Examples include: location of roadbeds out of stream bottoms, design of stream crossing structures to allow water to freely pass, rock surfacing of roads at stream crossings, keeping equipment from operating in or alongside streams, and maintenance of roads to allow proper drainage. These practices will be implemented in order to help maintain water quality (USDA Forest Service 1987a p II-7).

Soil and water conservation practices as outlined in the Soil and Water Conservation Practices Handbook (FSH 2509.22) will be incorporated into all land use and project plans as a principle mechanism for controlling non-point pollution sources, meeting soil and water goals, and protecting beneficial uses. Activities found not in compliance with soil and water conservation practices or State standards will be brought into compliance, modified, or stopped (USDA Forest Service 1987a p II-23).

A floodplain/wetland analysis will be made for all management actions involving wetlands, streams, or bodies of water (USDA Forest Service 1987a p II-24).

Projects involving significant vegetation removal will, prior to including them on implementation schedules, require a watershed cumulative effects feasibility analysis to ensure that water yield or sediment will not increase beyond acceptable limits. The analysis will also identify opportunities, if any exist, for mitigating adverse effects on water-related beneficial uses (USDA Forest Service 1987a p II-24).

The Inland Native Fish Strategy (USDA Forest Service 1995a) amended the Kootenai National Forest Land Management Plan. Buffers called Riparian Habitat Conservation Areas (RHCAs) are delineated adjacent to streams, lakes, and wetlands; their size is defined based on waterbody category.

ANALYSIS AREA AND METHODS

ANALYSIS AREA

The watersheds with proposed activities form the Analysis Areas for Water Resources. The Analysis Areas are shown in Map 2 in the Soil and Water Project File. Watershed boundaries are used as analysis boundaries. Watersheds were chosen because, by definition, a watershed is a unit of land upon which water flows downhill to a common outlet (Black 1996). Therefore, activities in adjacent watersheds would typically not affect each other. This analysis will focus on two, the Young and Dodge Creek watersheds. The Koocanusa tributaries are identified, but not carried through all analyses because they are diffuse in nature (do not have a common outlet), intermittent, and non-fish bearing; therefore they do not lend themselves to surveying, water yield, and/or sediment analysis.

Direct, indirect, and cumulative effects from past, proposed, current, and reasonably foreseeable activities are discussed for the streams in the project area. In general, a cumulative effects boundary is adequate when all the upstream activities are included and the effects are not discernable at a downstream boundary. The Koocanusa Reservoir is that boundary. Therefore the cumulative effects boundary is the same as the direct and indirect effects boundary for this analysis.

ANALYSIS METHODS

Stream Monitoring

Extensive field data has been collected in both Young and Dodge Creeks for more than ten years. This data was the foundation of the existing condition and the effects analysis for this project. Stream discharge and sediment data was collected using USGS methodology. The stream classification, stability, dimensions, and substrate data were collected using Rosgen (1996) methodology and the Region 1 Aquatic Ecosystem Unit Inventory (AEUI) technical guide, which incorporates the Rosgen methodology. This data provides a good indicator of trends in watershed condition. Stream channels change as a result of both man-caused and natural events. These changes are an indicator of the effect past disturbance has had on a drainage and/or the sensitivity of a drainage to disturbance. Collected stream data was compared with similar reference stream data collected on the Kootenai to determine watershed condition. It is important to note that not all measured parameters have to fall within reference parameters for a stream to be considered healthy. These are natural systems and even unmanaged reference streams do not fit entirely within each individual category.

Stream Flow Modeling

An equivalent clearcut acre (ECA) calculator was used in conjunction with the R1 Water and Sediment Yield Model (R1-WATSED) to predict peak flow increases (PFIs) for the existing and expected conditions of the watersheds in the Analysis Area. ECAs are a commonly used tool to analyze the change in peak flow by translating canopy removal from timber harvest, road building, and natural disturbances to a common unit, an ECA. ECA units are in acres, but are usually displayed as a percentage of the watershed area. The ECA calculator takes into account the initial percentage of crown removal and the recovery through re-growth of the vegetation after the initial harvest or disturbance. Map 9 in the Soil and Water

Project File displays the percent of original crown closure for the entire Analysis Area. This takes into account what was removed by either management activities or natural disturbance, and the amount of recovery, or tree growth, since the disturbance.

The ECA figures are then used to calculate water yield, in the form of peak flow increases, using regression curves generated from running the R1-WATSED Model over a variety of watershed sizes and precipitation regimes. The values generated from these calculations are used along with other information such as stream condition and channel type to interpret the existing and potential impacts resulting from past, present, and proposed land management activities.

The R1 Water and Sediment Yield Model (R1-WATSED) was used to predict existing and expected conditions of watersheds from logging, fire, and roads. It was designed to simulate the effects of natural disturbances and land management activities on average monthly water yields and peak flows.

Watershed Road Densities

Roads are known to re-route surface runoff and sub-surface flow; and/or increase sedimentation. Non-point sources of pollution are the primary cause of degraded water quality. For over 25 years, studies have shown that poorly maintained and located roads are often the highest contributors of non-point source sediment in forested areas (Brooks et al 1997; Luce and Wemple 2001), and impact aquatic habitat (Furniss et al 1991). A study on the Kootenai NF found that fine sediment in channels correlated with road density (MacDonald et al 1997). Roads and corresponding ditches, if not properly drained, can extend the stream channel network. This increases the drainage efficiency of the watershed and can result in a higher and/or more prolonged peak flows. Watershed road density (WRD) is the total miles of road divided by the watershed area in square miles. For this analysis, < 1.5 (miles/square mile) was considered low, 1.5 to 5 was considered moderate, and > 5 was considered high for WRDs (USDA Forest Service 2002a).

ASSUMPTIONS AND LIMITATIONS

Stream Monitoring

Representative reaches were selected to be monitored due to time and budget constraints. These reaches are assumed to represent the overall condition of the watershed. Other portions on the stream channel that have not been quantitatively monitored may have varying levels of stability. The stream monitoring sites were selected in areas that have the highest potential for effects, otherwise known as response reaches. In addition the measured sites, the majority of channels in the Analysis Area have had walk-through surveys completed to identify any potential concerns that may not have been picked up with the measured stream data.

Stream Flow Modeling

R1-WATSED model outputs were used to compare alternatives with regard to changes in stream flow. The model begins by estimating the average annual water yield for a given watershed in an undisturbed condition. R1-WATSED assumes a fully forested watershed. These calculations use precipitation in inches by landtype, hydrologic regime (reflected through a representative gauged stream), and a natural runoff function (precipitation to annual discharge conversion) to produce acre-feet of average annual water yield. R1-WATSED uses this estimated natural runoff and the existing computed disturbed areas (harvest, roads, and other disturbed acreage ECAs) to determine the total water yield increase. Next, R1-WATSED uses an Average Water Yield Increase Factor to estimate increases in runoff due to proposed management and/or fire. This factor expresses changes in evapotranspiration, interception, and snow accumulation and storage resulting from activities in the drainage. In addition, R1-WATSED uses an equation that is based on reductions of infiltration and increased drainage efficiency due to roads, to determine the runoff increases resulting from new roads. Logarithmic curves, based on habitat type groups, are then used to determine the vegetative/hydrologic recovery following logging, site preparation, and fire activities. Finally, R1-WATSED uses this recovery rate in conjunction with the above information to aid in the determination of the yearly water yield increase.

R1-WATSED was not designed, nor is it used, to develop exact estimates of flow. The model provides a consistent method of comparing alternatives to each other as well as to modeled natural conditions and/or measured stream conditions. The values generated by the model, in concert with other water resource information such as stream condition and channel type, are used to interpret the potential effects to a stream channel as a result of implementing a proposed land management activity. Values generated by the model are not to be considered as an absolute measure against verifiable standards, nor by themselves provide an answer in regard to the effects land management activities have on peak flow.

Conditions of the Model that require additional evaluation and documentation include episodic climatic events such as rain-on-snow, high-intensity thunderstorms, saturation caused mass soil movement, or shorter-duration peak flow events (majority of these are not prevalent in the Analysis Area – refer to existing condition below). Analysis of these, where needed, must be done outside of the model. Refer to the Soil and Water Project File for additional information on ECA and R1-WATSED models.

It is important to note that effects will be analyzed with regard to normal or average conditions and impacts to watershed processes in order to focus the analysis and more clearly contrast the alternatives. Precipitation events with return intervals greater than 6 years are highly variable in nature and largely speculative in terms of quantifying effects (Grant et al 2008). Large fires, major floods, and extreme episodes of bank instability and sediment movement are normal for these larger events (Benda et al 1998). The magnitudes of these events far overshadow the potential effects of this project proposal. Project impacts are not analyzed in this context, but rather within the context of the desired conditions in the watershed – stable banks, healthy riparian and aquatic habitat, and attainment of full support of all designated beneficial uses.

Watershed Road Densities

The analysis of watershed road densities was used as a surrogate for the potential of roads affecting flow alteration and sedimentation. The use of this methodology does have some limitations:

- There are site-specific differences on each road that could affect erosion or transport of sediment.
- Precipitation regimes differ slightly within each watershed.
- There is no differentiation of road distance to streams and therefore, the potential to route sediment to streams would be the same for each road.
- The road miles used for the analysis are generated from GIS layers. Therefore, some non-system roads may exist where they have not been mapped; and some of the roads that are mapped may be inaccessible, overgrown, or closed for long periods of time and may not be sediment sources.

This does not provide absolute numbers. However, it does provide estimates for comparison of alternatives. In addition, road density calculations are commonly used as a watershed indicator within the agency as well as among other agencies and researchers.

AFFECTED ENVIRONMENT

REFERENCE CONDITIONS

The watersheds in the Analysis Area have developed over time by adjusting to changes in climate, flow regimes, sediment inputs, and vegetation. Long before forest management-induced changes began to occur, natural disturbances were present across the landscape due to insects, disease, wildfire, and climate. Pre-settlement conditions in this area were likely to have been a repetitious cycle of disturbance and recovery, a pattern referred to as a pulse disturbance regime. Under a pulse disturbance regime, a disturbance occurs, resulting in a quick increase in water and/or sediment delivery that would potentially trigger some channel destabilization. The affected channel would then recover through time and generally stabilize until the next disturbance event. These disturbances typically occurred in a patchy, mosaic pattern (in both time and space), so that some areas remained undisturbed by a given event and provided refuge habitat for fish and other aquatic organisms.

Historically, the most prevalent large-scale disturbance in the Analysis Area was wildfire. High-intensity/stand replacing fires varied in frequency but had the most pronounced effects. Once high-intensity fire passed through an area, sediment delivery and water yield increased until forest floor and canopy vegetation sufficiently recovered. During the fire disturbance cycle, large woody debris usually remained within channels and riparian zones and greatly aided the recovery of these areas. It is very likely that increased erosion followed these fires, especially on steep slopes and in headwater channels where most vegetation would have been removed. More frequent and lower-intensity fires likely had little effect on these watersheds due to the minimal loss of overstory trees and understory duff layers.

Other types of disturbances that occurred included floods and debris slides. Floods may have affected several adjacent drainages or even the entire Analysis Area at the same time and occurred in a similar temporal pattern as the wildfires, usually providing time for recovery between major events. Channel stability and aquatic habitat can be affected by floods – steep reaches tend to scour and the material may be deposited in lower gradient reaches. Debris slides are not common in the Analysis Area (see the Soils Specialist Report).

Over the last century, there has been an anthropogenic change in the watershed disturbance regime. Management activities in the Analysis Area, including road building and forest canopy removal, have resulted in changes to water and sediment routing. These changes are lower in magnitude than the immediate post-disturbance effects that result from natural disturbances, but are generally higher than baseline conditions. In short, watersheds have not returned to their pre-management level due to the persistence of water and sediment increases contributed from roads at stream crossings and other continuing management activities. These sustained, moderate increases in water and sediment yields have resulted in the establishment of a 'press' disturbance regime (Wegner 1996) that has influenced these managed watersheds for the last 40-50 years.

The existing press disturbance regime is characterized by nearly constant, moderate levels of effects (increased water and sediment yields). The historic pulse disturbance regime had higher levels of effects, but the disturbances were less frequent and typically allowed time for system recovery between disturbance events.

EXISTING CONDITIONS

The existing condition is the result of past management activities (road construction, timber harvest, prescribed burning, etc.) and natural events (wildfire, floods, landslides, etc.) that occurred in the Analysis Area.

Geology and Climate

The physical environment of streams and lakes is determined by the geological and climatic characteristics of the watershed. Geology and climate are important because some watersheds are inherently more sensitive to disturbance than others. Watersheds with higher mean annual precipitation have greater potential for flood events and erosion on sensitive areas or steep slopes. For example, all things being equal, a watershed with 50” of mean annual precipitation is much more susceptible to problems than a watershed with 20” due to the additional volume of water. The greater the input of water, the greater the potential for soils to become saturated, leading to surface runoff. In addition, areas with shallow soils (bedrock) have less water holding capacity and are therefore more likely to have higher runoff.

The Analysis Area has been strongly influenced by continental glaciers. Glaciation generally scoured the ridge tops and noses and filled the side-slopes and valleys. Terraces and rolling topography exist along Koocanusa Reservoir and extend into Green’s Basin. Elevation ranges from 2459 feet at high pool on Koocanusa Reservoir to 7540 feet at the top of Robinson Mountain.

The Analysis Area is underlain by metamorphic sedimentary rocks known as the Belt Formation. These rocks were formed approximately one billion years ago from fine sediments that accumulated at the bottom of ancient seas. These deposits were changed into hard dense rock formations under great pressure and heat. They form a relatively stable foundation for the watersheds in this area (Kuennen and Gerhardt 1995). For more information on the geology in the Analysis Area, refer to the Soils Section of the Document.

The Analysis Area falls within KNF Hydraulic Region III, which is seldom influenced by rain-on-snow events (USDA Forest Service 1990; Hoffman 1993; MacDonald et al 1997). Mean annual precipitation in the Analysis Area ranges from 13 to 43 inches (refer to Map 3 in the Soil and Water Project File). At lower elevations, most of the precipitation falls as rain; while in the upper elevations most of the precipitation falls as snow.

Geological and climatic attributes are discussed here to describe a watershed’s inherent sensitivity to disturbance. These inherent conditions do not change as a result of management. They merely set the stage for analysis of effects. Therefore, geology and climate will only be discussed further in this analysis as they pertain to other indicators.

Stream Flow Monitoring

Stream monitoring of flow relationships in the Analysis Area show that past and current levels of Peak Flow Increases (PFIs) are not causing channel degradation at the Young Creek or Dodge Creek monitoring sites. Stream flow can be discussed in terms of annual yield or PFIs. The greatest potential for change within a stream channel occurs during high-flow periods (King 1989). Therefore, increases in magnitude and duration of peak flows are of the most concern.

Spring peak flows in the Analysis Area normally occur during May or June (Hoffman 1993), but elevated flows can occur throughout the year in response to precipitation events. The timing, magnitude, and duration of runoff events may be changed when vegetation is removed by management activities or natural disturbances.

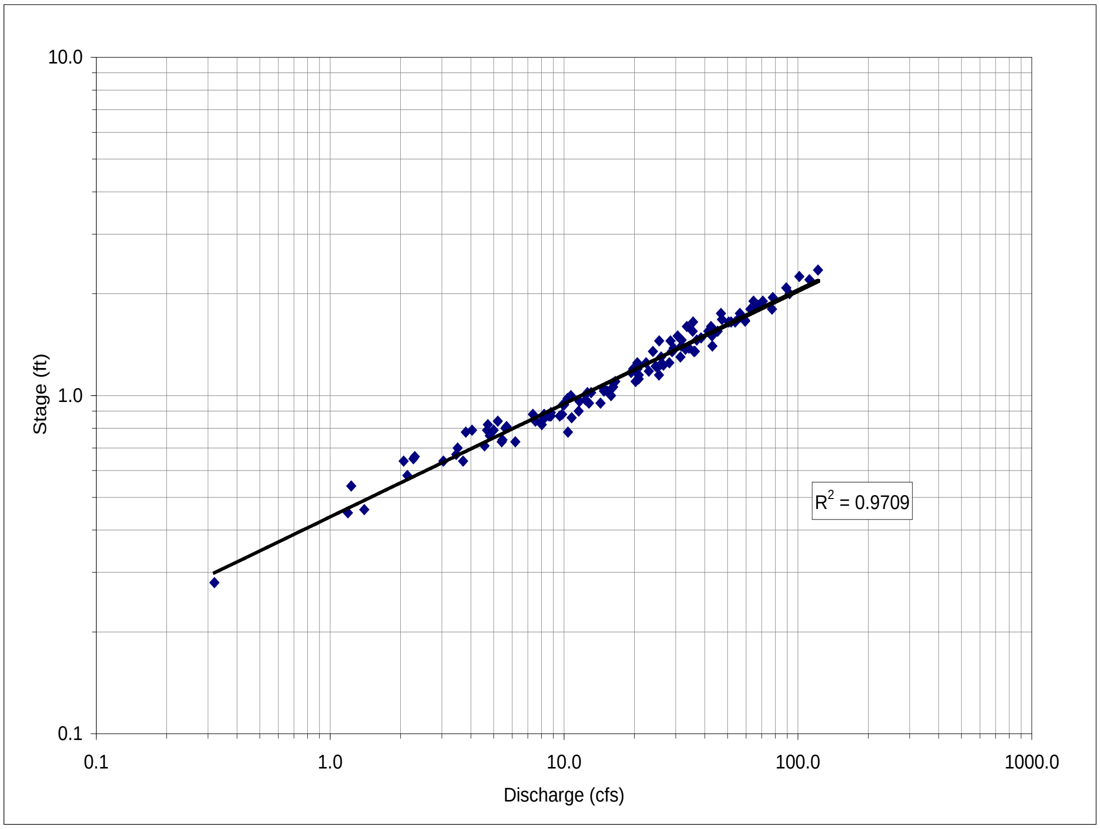
The removal of forest canopy through natural disturbances or management activities affects snow accumulation and melting processes, commonly resulting in an increase in snow-pack accumulation and snowmelt rates, thereby increasing runoff magnitude and volume (MacDonald et al 1997; and Hoffman 1993). Generally, there is an increase in water yield due to the combination of reduced evapotranspiration and precipitation interception. Map 4 in the Soil and Water Project File displays past harvest within the Analysis Area.

Runoff patterns can be affected when water is rerouted by roads. The compacted soils associated with roads and trails can act as sources of overland flow and can intercept groundwater, converting it to surface flow. Roads and corresponding ditches, if not properly drained, can extend the stream channel network, increasing the drainage efficiency of the watershed. Changes in flow patterns could result in higher but shorter peak flows and/or a series of smaller, more prolonged peak flows depending on aspect, elevation, precipitation, drainage pattern, etc. Interception and re-direction of runoff by roads and other compacted surfaces can add to the consequences of any additional runoff. Map 6 in the Soil and Water Project File displays the roads in the Analysis Area.

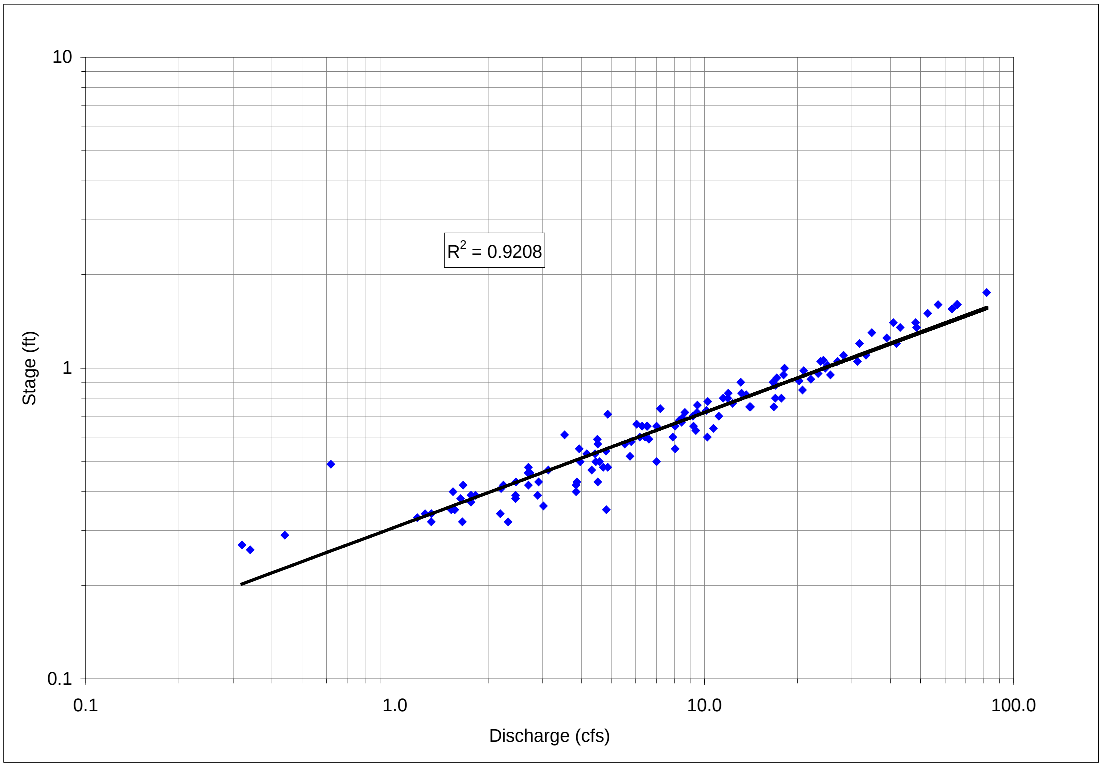
There are two active stream flow monitoring locations within the Analysis Area, one on Young Creek and one on Dodge Creek. Both sites have been monitored since 1997. Water Figures 3-1 and 3-2 display the stage/discharge relationship and R^2 values for the stream flow stations in the Analysis Area. In a perfect situation (or a concrete flume study) the relationship (R^2) would equal 1. That is, an increase in water stage (ft) and its corresponding increase in water discharge (cubic feet per second or cfs) would have a consistent relationship. For natural stream systems, if the R^2 value can maintain a value greater than 0.75 over the course of many years then the stream channel at that location is considered to be very stable. Values less than this indicates a stream channel in transition (either in a positive or negative direction).

Water Figures 3-1 and 3-2 both show that Young (120 sample points) and Dodge Creeks (126 sample points) are very stable with R^2s of 0.97 and 0.92. Therefore, it appears that past and current levels of PFIs are not causing channel degradation in and around the monitoring sites in the Young and Dodge Creek Watersheds.

Water Figure 3- 1 Stage/Discharge Relationship and R^2 Value for Young Creek (1997-2006)



Water Figure 3- 2 Stage/Discharge Relationship and R^2 Value for Dodge Creek (1997-2006)



Water Quality Monitoring

The Clean Water Act (CWA) requires states to identify waterbodies they believe are not meeting water quality guidelines and are at risk of not supporting their designated beneficial uses. These waterbodies are called Water Quality Limited Segments (WQLS). There are no WQLS waterbodies within the Analysis Area. However, watersheds in the Analysis Area do contribute surface flow to Koocanusa Reservoir, which is listed as a WQLS. The beneficial use concerns for Koocanusa Reservoir are identified in Water Table 3-1.

Water Table 3- 1 Water Quality Limited Segments in the Young Dodge Analysis Area[1]

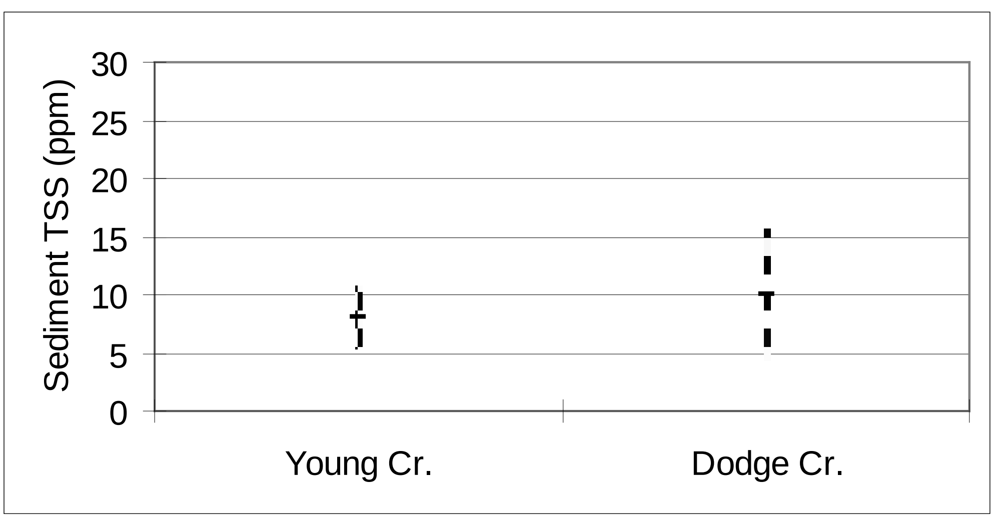
Listed Stream Segment	Beneficial Use Support Status	Pollutant of Concern	Source of Pollutant
Koocanusa Reservoir	Aquatic Life Support (Partial) Cold Water Fishery (Partial)	Flow Alteration	Dam Construction

[1] Information in this table was taken from the 1996 303(d) List.

The Koocanusa Reservoir was not listed as WQLS due to forest practices or management. It was listed due to flow alteration caused by the Libby Dam. Future management actions will not affect the existing flow alteration. Therefore, WQLSs will not be discussed further.

Sediment samples have been taken since 1997 at the previously mentioned Young and Dodge Creek monitoring sites. Based on samples collected from 1997 to 2006, suspended sediment regimes appear to be at acceptable levels for the streams in the Analysis Area. Typically in snow-dominated systems there are higher levels of suspended sediment during high spring runoff events. During the remainder of the year, suspended sediment levels remain low. Brooks et al (1997) states that suspended sediment concentrations in undisturbed forested watersheds are relatively low, or approximately 10-20 parts per million (ppm). Water Figure 3-3 displays the 10-year average of sediment measured as total suspended solids (TSS) at the 90% confidence interval. The 10-year average from samples taken in Young and Dodge Creeks are 8 ppm and 10 ppm, respectively.

Water Figure 3- 3 10-Year Average Suspended Sediment (1997-2006)



Stream Channel Surveys

The Rosgen Stream Classification System (Rosgen 1996) was used in this analysis to help explain the processes, functions, and patterns of channels and to predict channel responses. The Rosgen Classification is derived from field measurements of stream attributes including entrenchment, width-depth ratio (W/D), slope, and sinuosity. A numerical classification of particle size is added to the basic Rosgen Level II Channel Type to characterize the size of the material that makes up the channel bed. Bed material size is important to channel stability and response because smaller particles can be eroded and transported by lower energy flows than larger particles. The size categories are identified as 1 (bedrock), 2 (boulder), 3 (cobble), 4 (gravel), 5 (sand), and 6 (silt). The channel form is maintained by bank full flows. Water Table 3-2 gives a brief description of each the channel types in the classification system.

Water Table 3-2. Water Table 3- 2Stream Channel Types and Associated Attributes

Channel Type	Thread	Entrenchment	Width/Depth	Sinuosity	Gradient
A	Single Channel	High	Low	Low	High
B	Single Channel	Moderate	Moderate	Moderate	Moderate
C	Single Channel	Slightly	Moderate-High	High	Low
D	Multiple Channels	NA	Very Low	Very High	Low
E	Single Channel	Slightly	Low	Very High	Low
F	Single Channel	High	Moderate-High	Moderate	Low-Moderate
G	Single Channel	High	Low	Moderate	Low-Moderate

Stream channel surveys on permanent sites in the Analysis Area were conducted during the 2006 field season. The data is displayed, and compared to reference stream data, in Water Table 3-3. Stream monitoring locations are displayed in Map 8 in the Soil and Water Project File.

Water Table 3- 3 Stream Survey Data Compared to KNF Reference Stream Data

Stream	Reach	Channel Type	Entrenchmen t	Width-Depth	Pool Spacing (# BFWs1)	% Stable Banks
Dodge	2	B4	2.0 / 1.1-2.6	22 / 8-30	4 / 4-7	99 / 65-100
Dodge	4	B4	1.8 / 1.1-2.6	12 / 8-30	4 / 4-7	99 / 65-100
Young	2	B4	1.5 / 1.1-2.6	17 / 8-30	6 / 4-7	94 / 65-100
Young	4	B4	2.3 / 1.1-2.6	18 / 8-30	8 / 4-7	73 / 65-100

1 BFW = stream bank full width

Information in Water Table 3-3 displays that the reaches monitored fall close to or completely within reference ranges. Both Young and Dodge Creeks are B channel types (Rosgen 1996), which are relatively stable. Review of the physical stream parameters in Water Table 3-3 shows all stream indicators being within reference ranges with the exception of one parameter. Young Creek Reach 4 has a pool spacing of eight bank full widths and the reference range is four to seven. This is not of concern at this time because it is close to being within range, the remaining parameters are within reference ranges, and all of the parameters in Reach 2 (downstream of Reach 4) are within reference ranges. In addition, not all reference streams are completely within each range.

Riparian Areas and Wetlands

Riparian areas are a transition zone between permanently saturated wetlands and dryer upland areas. These areas exhibit vegetative or physical characteristics reflective of permanent surface or subsurface water influence (USDI Bureau of Land Management 1993). Natural, undisturbed, or well-managed riparian/wetland areas provide values and benefits far in excess of the land area they occupy (Brooks et al 1997). Riparian areas maintain the integrity of aquatic ecosystems by (1) influencing the delivery of coarse sediment, organic matter, and woody debris to streams, (2) providing root strength for channel stability, (3) shading the stream, and (4) protecting water quality (USDA Forest Service 1995). Depending on the stream channel type and volume (rate of flow), the relative magnitude of these functions can vary widely. For example, large woody debris (LWD) is often a significant component of physical channel structure in small streams that do not have enough flow to easily move LWD, but plays a significantly smaller role in large rivers where LWD is continuously moved through the system.

Riparian areas are defined based on proximity to streams and rivers. Wetlands are defined by having a water table usually near the ground surface or where the land is at least seasonally covered by shallow water. Riparian areas and wetlands are important components of the overall landscape, forming some of the most dynamic and ecologically rich areas on the landscape. Map 7 in the Soil and Water Project File displays the riparian areas, wetlands, streams, ponds, and lakes in the Analysis Area. There are no existing concerns identified for the riparian areas and/or wetlands within the Analysis Area.

DIRECT AND INDIRECT EFFECTS

Direct and indirect effects on aquatic resources are described below for proposed activities identified in Chapter 2. This section considers the effects of proposed management activities.

MEASUREMENT INDICATORS

The measurement indicators for compliance with law, regulation, and policy are:

- Changes in PFIs;
- Changes in road densities; and
- Miles of road BMP improvements.

CHANGES IN PEAK FLOW

Timber harvest can increase the total water yield and/or peak flow generated during spring snowmelt or rainfall events. The increase in spring runoff can lead to localized adverse hydrologic responses. This depends on the magnitude of the increase, the stream type, and the channel condition. In northwest Montana, increases in peak flows are primarily due to modifications in snow accumulation, snowmelt runoff, and changes in evapotranspiration rates (USDA Forest Service 1973b). These increases can then be modified by components of the transportation network (roads and stream crossings) that interrupt normal runoff patterns.

The only Forest Plan Standard for stream flow is the following:

Projects involving significant vegetation removal will, prior to including them on implementation schedules, require a watershed cumulative effects feasibility analysis to ensure that water yield or sediment will not increase beyond acceptable limits. The analysis will also identify opportunities, if any exist, for mitigating adverse effects on water-related beneficial uses (USDA Forest Service 1987a p II-24).

The Forest Plan suggests using the Water Yield Guidelines in Appendix 18 of the KNF Forest Plan (USDA Forest Service 1987b). The intent of the water yield analysis process is to protect beneficial uses from the potential effects of peak flow increases. Threshold-type water yield increase numbers such as those identified in the KNF Forest Plan and in subsequent documents are to be used as "red flags” to indicate instances where the potential is higher for channel damage from flows. The intent is that these "red flags" would show a need for more extensive field reviews that would ultimately result in either modifications or mitigation. In instances where time limitations did not allow for field review, activity would be reduced until levels fall below the threshold. The threshold numbers are not necessarily static and can change based on the condition or trend of the stream channel.

Water yield increase thresholds, ranging from 10 to 20% PFI, represented the best information available at the time the Forest Plan was written. These numbers were developed over time as watersheds were compared with modeled results, beginning in the 1970s with the release of Hydrology Part 2 (USDA Forest Service 1973b). Multiple projects have occurred in the Analysis Area since the Forest Plan was issued (Water Table 3-4). The streams in the Analysis Area were described as being in fair to good condition with a positive trend. The RPFI was set at a conservative 13% until more qualitative data could be collected.

Water Table 3- 4 Previous Documents Forest Plan RPFIs

Watershed	Comp 4 (1994)	Comp 2 (1994)	W. Kootenai (1998)	Marias (2000)	Young J (2002)
Young	NA	13% PFI	13% PFI	13% PFI	13% PFI
Dodge	14% PFI	NA	13% PFI	NA	NA

Since the Forest Plan was written, a network of water monitoring and survey sites have been established. Monitoring data has been collected for more than ten years on both Young and Dodge Creeks. As can be seen by the data in Water Figures 3-1 through 3-3 and Water Table 3-3 above, the Project Record, and District Files, the channels appear to be stable and within flow, sediment, and channel geometry ranges for reference streams.

Historically, as a result of natural disturbance (primarily wildfire in the project area), peak flow increases ranged from 2 to 27 percent, depending on the Vegetation Response Unit (VRU). Map 5 in the Soil and Water Project File displays the VRUs within the Analysis Area. For more details on how historic peak flows were calculated refer to the document, Historic Peak Flow Increases, located in the Soil and Water Project File.

Forest Plan RPFI levels (10 to 20%) are well within historic levels of PFIs (2 to 27%). In addition, over ten years of stream data shows no statistically measurable changes within the stream channel as a result of management and natural disturbances within the same time period. Much of this can be attributed to improved logging practices, designating riparian buffer zones, and implementing BMPs for both timber harvest and roads.

Professional interpretation of predicted consequences and determination of regulatory compliance is based on field reviews, data collection, analysis and conclusions, model results and projections, experience and review of similar projects in the vicinity. These factors form the basis for conclusions about meeting Forest Plan standards and protecting beneficial uses. The identification of a RPFI in a NEPA document means that the watershed professional has taken all available information (including potential mitigation activities) and has determined that watershed conditions and beneficial uses will be protected.

Following adaptive management, it was concluded that, based on Forest Plan direction, recommended PFIs could be raised to 14 or 15% for Young Creek and Dodge Creek. This conclusion is based on over ten years of stream data and Forest Plan direction. Forest Plan direction states that it is appropriate for streams in good condition to have PFIs between 14 and 18%. The stream monitoring data showed no statistical changes as a result of three different timber harvest projects and one large wildfire within the Analysis Area.

Water Table 3-5 displays the WATSED modeled PFIs associated with each alternative, by watershed, in the Analysis Area for this project. The watersheds are displayed on Map 2 of the Soil and Water Project File.

Water Table 3- 5 Changes in Peak Flow by Alternative (% PFI)

Watershed	Forest Plan RPFI	Existing PFI 2006	Existing PFI 2010	Alt. 1 Added PFI	Alt. 1M Added PFI	Alt. 2 Added PFI	Alt. 3 Added PFI
Young	13	10	8	3	2	0	2
Dodge	13	11	9	4	3	0	4

Note: Existing PFI 2006 was from the original DEIS. This project was substantially delayed and existing condition PFIs were modeled again. The change in PFI is due to vegetative recovery that has occurred between 2006 and 2010. In addition, the alternatives are the maximum PFI (worst-case-scenario) that would occur if all harvest took place in 2011. In reality, most harvest would not occur before 2012 and would be spread over a 5+ year range.

Alternative 1, 1M, and 3

Alternative 1, 1M, and 3 would increase PFIs by two to three percent in Young Creek and three to four percent in Dodge Creek (Water Table 3-5). These increases are within both historic and Forest Plan RPFI ranges. Alternative 1 would have the highest increase in PFIs of all the alternatives, posing a higher risk to Water Resources, followed by Alternative 3 and finally Alternative 1M. The differences between the alternatives are small and a one to two percent difference would probably not be measurable at the stream channel. All action alternative PFIs are within Forest Plan ranges and are expected to protect beneficial uses. Stream surveys and flow monitoring indicate stable channels and the stream types themselves are very resistant to change.

Alternative 2

The No-Action Alternative, Alternative 2, would result in no increases in PFIs (Water Table 3-5). PFIs are within historic ranges and Forest Plan Guidelines. As vegetation continues to grow, PFIs would continue to decrease. There would be no increase in the risk of bank erosion from management activities. There would be no harvest activity and therefore would have no additional risk of erosion on harvested areas. Channel conditions would remain the same or improve. This alternative meets Forest Plan direction for PFIs and is expected to maintain beneficial uses at current levels.

CHANGES IN ROAD DENSITIES

Studies have shown correlations between sediment production and road length (Reid and Dunne 1984) and between fine bed particles and the number of road/stream crossings (Schnackenberg and MacDonald 1998). The terms ‘intermittent stored service’ and ‘decommissioning’ are road status terms. A road in ‘intermittent stored service’ would not be used for 10-20 years, while a ‘decommissioned’ road would be removed from the road system. The techniques used for decommissioning and placing roads into intermittent stored service can be similar. In either case, roads would be barricaded to prevent motorized access. Other actions may include culvert removal, water bar installation, road surface ripping, woody debris placement, seeding, and fertilizing. Re-contouring may occur on some road segments and would be more likely to occur for decommissioning than for intermittent stored service. Water Table 3-6 displays the miles of proposed intermittent stored service and decommissioning by alternative and source of funding.

Water Table 3- 6 Proposed Intermittent Stored Service and Decommissioning by Funding Source

Activity	Alternative 1	Alternative 1M	Alternative 2	Alternative 3
Intermittent Stored Service – timber sale	11.63	11.63	0	11.63
Intermittent Stored Service – other funding	15.39	15.39	0	15.39
Total Intermittent Stored Service	**27.02**	**27.02**	**0**	**27.02**
Decommissioning – timber sale contract	3.90	3.90	0	3.90
Decommissioning – other funding	8.35	8.35	0	8.35
Total Decommissioning	**12.25**	**12.25**	**0**	**12.25**

Funding for road decommissioning would come from a combination of sources, which has an influence on the timing of implementation. Roads used for a timber sale would be decommissioned with the sale contract. This work is assured and would commence after use of the road has been completed.

Other roads would be funded through sources that may include appropriated funds. These funding sources and the timing are not assured. The Kootenai NF has been committed to road decommissioning and storage, and funding has generally been made available (refer to document titled "Decommissioning Record on the Fortine and Rexford Ranger Districts" in the Soil and Water Project File). The available funding is apportioned to projects across the Forest based on priority that is driven by risk to other resources. The timing for work that requires appropriated funding is budget-dependent, and is independent of harvest activities. In some cases the decommissioning may occur before harvest activities commence. This work would be accomplished when funding became available after the final Decision. This work would take at least one and possibly several years to complete.

Road decommissioning and storage reduces the number of roads on the landscape and thus changes the road densities within each watershed. Water Table 3-7 displays the changes in road density by alternative. It is important to note that intermittent stored service roads would be used again in the next ten to twenty years. This would affect road densities depending on the number of roads opened and the amount of time they are left open.

Water Table 3- 7 Road Densities by Watershed

Watershed	Existing	Alt. 1	Alt. 1M	Alt. 2	Alt. 3
Young	4.0	3.4	3.4	4.0	3.4
Dodge	4.8	3.7	3.7	4.8	3.7

Alternative 1, 1M, and 3

Alternatives 1, 1M, and 3 are identical with regard to road decommissioning, intermittent stored service, and thus, road densities. The decommissioning and intermittent stored service that are contractually required under timber sales would occur in conjunction with the sales. This work is assured and the timing would be tied to the timber sales, distributed over the next 5 years. The work requiring other funding is likely to occur, but funding is not assured. Because this work is not required as water quality mitigation for other elements of this project, the timing of this work in relation to other actions is not crucial. As shown in Water Table 3-7, Alternatives 1, 1M, and 3 would utilize timber sale contracts for 11.63 miles of intermittent stored service and 3.90 miles of road decommissioning.

Road decommissioning and intermittent stored service that requires other funding sources would occur as funding becomes available. If all work is fully funded and implemented, Alternatives 1, 1M, and 3 would put 27.02 miles of road into intermittent stored service and decommission 12.25 miles of road (refer to the Transportation section for specific road numbers).

Alternatives 1, 1M, and 3 would have a greater benefit to the Analysis Area than Alternative 2. Decommissioning and intermittent stored service could cause some short-term sediment increases but are expected to result in a long-term sediment reduction. This would also reduce the risk of culvert and road failures that could introduce large quantities of sediment (refer to Soil and Water Project File document "Short vs. Long-Term Effects"). The disturbance associated with water bar installation and road ripping would make more sediment available for transport into channels until the areas stabilize and vegetation becomes established. This is expected to take one to two years after the work is completed based on Hickenbottom's monitoring (2001) of road re-contouring on the Lolo National Forest. Wegner's (1999) monitoring of culvert removals on live channels on the Kootenai NF indicates that increases in sediment are short-lived with total suspended sediment (TSS) resembling background levels within 48 hours of completion of work. The sediment generated in this project would be minimized through the application of BMPs (Appendix 2 of the FSEIS). In the long-term, chronic sediment contributions associated with these roads would be reduced. Wegner's work (1999) also shows improvements in aquatic conditions, including decreases in fine sediment, an increase in spawning redds, and beneficial trends in aquatic macroinvertebrate populations following road upgrades and decommissioning. Road decommissioning and storage, whether implemented in part or full, is expected to improve beneficial uses.

Alternative 2

Under Alternative 2, no roads would be decommissioned or put into intermittent stored service. There would be no short-term sediment increases associated with the actual decommissioning and storage work. However, there would also be no reduction in existing sediment inputs from these roads or reductions in the risk of road crossing failure. The roads would remain on the landscape, but would not receive maintenance as quickly as with the Action Alternatives and could develop erosion problems that would go un-remedied for years.

ROAD BMP IMPROVEMENTS

This project was designed to reduce the impacts that roads have on aquatic resources by identifying and treating known sources and potential sources of road-associated sediment through road drainage improvements through BMP upgrades. Road drainage improvements would focus on preventing water and sediment generated by the road network from entering streams. Improvements would emphasize disconnecting storm water runoff from perennial and non-perennial streams. The primary methods for accomplishing this are improvements to road surface and ditch drainage, road surfacing, and modifying stream crossings (Furniss et al 1991). These activities fall under the definition of road maintenance. Improvement activities contractually required under timber sales would occur prior to and during harvest and would be inspected after harvest to ensure they still meet specifications. Water Table 3-8 displays the miles of road maintenance that would occur within the Analysis Area for each alternative.

Water Table 3- 8 Road Maintenance/Improvements by Alternative

Timber Sale Funded Activities	Alt. 1	Alt. 1M	Alt. 2	Alt. 3
Proposed Miles Road BMP Improvements	100	98	0	97
Total Miles Road in Analysis Area	274	274	274	274
Proposed % of Roads being Improved	36	34	0	35
Potential Stream Crossings Improved	45	43	0	44

Alternative 1, 1M, and 3

Alternatives 1, 1M, and 3 include road BMP improvements that are contractually required under timber sales. Those improvements would occur in conjunction with the sales (Water Table 3-8). Alternatives 1, 1M, and 3 are similar, with regard to potential road miles and stream crossings improved. Refer to Map 10 in the Soil and Water Project File showing roads identified for improvement. This work is assured and the timing would be tied to the timber sales, distributed over the next 10 years. Because timber sales require road work to be done before logs can be hauled, contractual road improvements done with timber sales would be accomplished in a shorter timeframe than would be done with the Forest road maintenance budget in any given year (Alternative 2). Therefore, it is expected that Alternatives 1, 1M, and 3 would have a greater potential to benefit to water quality in a shorter amount of time than Alternative 2.

Research has shown that improved road design and road maintenance can reduce road-related erosion (Gucinski et al 2000; Kennedy 1997). Road maintenance in Alternatives 1, 1M, and 3 would focus on reducing the distance water flows in ditches, reducing road surface erosion, disconnecting ditch water from streams, and reducing the probability of stream crossing failures. Although minor inputs of sediment into streams are possible, the long-term benefit is a reduction in routed water and sediment. Short-term sediment inputs into streams are expected to be minimized or eliminated through the use of BMPs and adhering to INFS guidelines (USDA Forest Service 2002b; USDA Forest Service 1995). For more in-depth discussion of sediment analysis and research, please refer to the document titled "Road/Sediment Analysis" in the Soil and Water Project File. The road related improvements in Alternatives 1, 1M, and 3 would at least maintain, and probably improve, water quality and beneficial uses throughout the Analysis Area. Application of BMPs for all road activities would minimize their short-term effects on water quality.

Alternative 2

Alternative 2 would not implement timber-related road improvements, resulting in no new impacts and no additional benefits to water quality. However, regular district road maintenance (estimated 3 to 4 miles per year) would continue as funding becomes available. Over the 10-year planning period, the condition of the roads would slightly improve above existing condition but not to the levels of the action alternatives. The risk of road erosion during large events would improve as compared to existing condition. However, the risk of an extreme runoff event triggering road erosion and culvert failures would remain higher with Alternative 2 than Alternatives 1, 1M, or 3.

SPECIAL USES AND OTHER PROPOSED ACTIVITIES

The identified Recreation Projects would have effects similar to road decommissioning and BMP upgrades on water quality. Approximately 1.5 miles of Trail #59 would be removed. This portion of the trail is part of Road 999, which is proposed for intermittent stored service and was analyzed in the section above. Short-term sediment inputs would result from project implementation, followed by long-term reductions in sediment yield. Access to Trail #59 would now be from Trail #238 with an existing pullout to be improved for parking.

The proposed boat ramp would clear approximately one acre. The boat ramp itself is primarily below high pool on Koocanusa Reservoir. This would not degrade water quality in the Reservoir because most of the area is currently exposed sand. The existing road into the proposed boat ramp would be realigned and improved. The only new disturbance above full pool would be a small parking area. The road upgrades and the addition of a small parking area are expected to have little effect on water quality. The amount of sediment generated would not be measurable in comparison to the amount of annual shore erosion along the Reservoir. No other projects presented in Chapter 2 would affect water quality.

Approximately 1.5 miles (< 4 acres) of utility lines are proposed in the Analysis Area. Typically new utility lines are plowed along the shoulder of existing road corridors, so no additional sedimentation or tree removal is expected. Therefore, disturbance associated with utility lines is not expected to measurably affect water quality or peak flows.

CUMULATIVE EFFECTS

Cumulative effects are the result of all the impacts past, current, and reasonably foreseeable activities have on a resource. A summary of activities are listed in Tables III-1 and III-2 in Chapter III. More specific information can be found in Appendix 5. Past activities have resulted in the "Existing Condition" described above. The anticipated effects from proposed activities were then described in the section titled "Direct and Indirect Effects." The sum of the existing condition and the direct and indirect effects of proposed actions in combination with current and reasonably foreseeable actions result in the cumulative effects described in this section.

The Analysis Areas for cumulative effects with regard to Water Resources consists of the same watersheds identified earlier in the document. All the watersheds empty into the Koocanusa Reservoir and are not connected and thus, not measurable.

Water Resources would be protected under the implementation of any of the alternatives. This is based on past monitoring of stream flow, water quality, and channel stability; and all laws, regulations, and policies being met. Below is the rationale for this conclusion.

CURRENT VERSUS HISTORIC MANAGEMENT PRACTICES

There are clear differences between past and current land management practices and policies. Improvements in land management practices are due to improvements in science and technology, ongoing monitoring actions, and changing public values.

The earliest harvest methods involved harvesting the biggest, most valuable trees and leaving the remaining trees on-site. Streams were sometimes used to transport logs (i.e., splash dams, skid trails, etc.) causing direct impacts to the stream channel and adjacent riparian areas. Harvest methods in the 1950-70s focused primarily on providing low-cost wood products. Harvest placement often occurred in the highest volume and most easily accessible stands including riparian areas next to streams. At times equipment was driven through or down streams to skid logs to landings. Logging systems were selected based on economics. The least expensive method to transport trees from the forest to the mill was usually selected. This sometimes involved harvest on steep slopes that created excessive soil disturbance and increased the risk of erosion. In addition to the harvest activities, fuels reduction, and site preparation for natural regeneration or planting often included dozer piling.

During the early to mid-20th century, road construction was focused primarily on the easiest access route to a given area with little thought to road maintenance. As a result, many roads were constructed in river bottoms, floodplains, and adjacent hillsides. The roads efficiently provided access, but frequently constricted streams, reduced the effectiveness of riparian areas, and provided an avenue for erosion and discharge of sediment into streams. Roads were often expanded from existing trails, paths, or abandoned railroad beds to accommodate newer equipment and current land uses. In these cases, the location and design were predetermined from the previous use and era. As time progressed, roads were designed and located to provide access and haul product at minimum cost. In the decades following World War II (1950s to 1970s), the road network was rapidly expanded to support the domestic need for lumber and recreation.

Over the last twenty years, impacts to soil and Water Resources from logging and road activities have been reduced because of Best Management Practices (BMPs), the Inland Native Fish Strategy (INFS), and other changes based on new science and technology. It is well documented that BMPs and INFS riparian habitat conservation areas (RHCAs) significantly reduce sediment delivery to streams compared with historical practices (USDA Forest Service 1995).

Harvest methods and removal of timber products from the national forest changed substantially over time. Modern timber harvest prescriptions and design emphasize desired conditions of the forest after timber harvest. This often results in the retention of various amounts of trees to address objectives that may include seed production, site sheltering, water quality, soil productivity, wildlife, and/or visuals. Elements of modern harvest prescriptions that address specific resource concerns include retention of snags and down wood for soil nutrition, and maintaining sediment filtering vegetation in riparian areas near lakes and streams. Jammer roads and splash dams are practices no longer used and dozer piling is rarely used. Forest BMPs currently incorporated into timber harvest activities include (refer to the BMP document in the Soil and Water Project File for a complete list of BMPs):

- Maintaining water quality and soil productivity, and reducing erosion and sedimentation through timber harvest unit design. Some examples include avoiding sensitive areas, delineating RHCAs, etc.
- Limiting the operation period of timber sale activities to dry, frozen, or snow covered conditions to minimize soil erosion, sedimentation, and soil productivity.
- Determining the proper log retrieval system for the timber harvest unit slope to protect from degradation of water quality or soil productivity. Tractor skidding is typically on ground less than 40% slope. Skyline and other cable yarding systems are used on steeper slopes.
- Controlling erosion during and after harvest activities to protect water quality and soil productivity. Some examples include ripping and/or water barring skid trails and landings, seeding and fertilizing, spraying for weeds, etc.

Road management activities have also changed significantly over time. With improved land management methods, the need for high road densities in a given area has decreased. Excess roads are decommissioned reducing water and soil impacts and allowing those areas to begin to recover. Existing, reconstructed, and/or new roads currently incorporate the following BMPs (refer to the Appendix 2 for a complete list of BMPs):

- Road drainage controls are now incorporated into designs to:
    - Reduce water flow in ditches by providing frequent cross-drains to relieve ditch flows;
    - Avoid water movement on road surface by dispersing the flow quickly through road surface deflectors, drain dips, or outsloping;
    - Disconnect ditch water from streams by discharging storm water runoff onto stable vegetated or armored slopes before it enters waterways; and
    - Size new and existing stream crossings to safely pass 100 year flood events and provide for fish passage, where applicable.
- Avoiding highly erosive soils or unstable slopes.

- Locating or relocating roads outside of riparian areas where practical; and minimizing or reducing the number of stream crossings.
- BMP implementation and effectiveness have been monitored and documented on the Kootenai National Forest. Refer to Consistency with Regulatory Framework for a more in-depth discussion of BMP monitoring.

In 1995, the Forest Plan was amended to include INFS management direction (USDA Forest Service 1995). The implementation of INFS gave greater protection to soil and Water Resources in riparian areas adjacent to streams, lakes, and wetlands. INFS gives riparian dependant resources priority over other resources in RHCAs. RHCAs are not totally prohibitive to management. Rather, the primary purpose for management within them is aquatics. Activities that occur in them must either benefit the riparian area and associated aquatic features or, at a minimum, not slow the rate of recovery within the riparian area.

CURRENT AND REASONABLY FORESEEABLE ACTIONS

In the following discussion, the effects of past, current, and/or reasonably foreseeable activities are considered cumulatively with activities proposed in this project. The effects were either described as not contributing effects, contributing indiscernible effects, or having a measurable effect on Water Resources. Those actions that may have measureable effects were then analyzed further, by the same indicators used in the Direct and Indirect Effects Section.

Vegetation Management and Fuels Reduction Activities

There are no current or reasonably foreseeable Forest Service commercial timber sale projects planned within the Analysis Area. Therefore, no additional effects would be contributed from these activities.

It is expected that there would be salvage of blown-down trees within the Analysis Area. Treatment acres are not expected to exceed 20 acres per year over the next 10 years. If salvage were to occur the appropriate analysis would be conducted. Removal of blown-down trees does not affect peak flows and therefore would not contribute additional effects to Water Resources. However, some short-term sediment could be generated from ground disturbance related to mechanized equipment. Such equipment is typically restricted to existing trails, roads, and fire lines, but there are cases where new disturbance is created. It is expected that BMPs, riparian buffers, and design criteria would minimize or eliminate the risk of generated sediments reaching live streams. This assumption is supported through the monitoring data presented above. Therefore, with regard to sediment, the salvage of blown-down trees is expected to contribute indiscernible effects to Water Resources.

Precommercial thinning is an ongoing and reasonably foreseeable activity. It is expected that 2000 acres would be thinned within the Analysis Area over the next ten years. Ongoing and reasonably foreseeable precommercial thinning activities within the Analysis Area would contribute indiscernible effects to riparian vegetation and structure, peak flows, sediment delivery, and water quality within the Analysis Area and beneficial uses would be protected. Precommercial thinning does not result in measurable crown removals and there is no additional ground disturbance. All thinning projects follow INFS direction.

Approximately 93 acres of Dodge Mountain Pine Beetle Unit 1 overlaps with the Young Dodge Analysis Area. The unit was proposed in the 2011 Commercial Thinning Project. The project proposes removing primarily pole-size trees <10 DBH followed by either hand or excavator piling in order to reduce the susceptibility of mountain pine beetle attack. A secondary objective is to reduce ladder fuels, thereby lessening the chance of a crown fire (these stands are in the WUI). The proposed commercial thinning is expected to have an immeasurable effect on peak flows because it would only result in 15 ECAs in Koocanusa Tributaries and no ECAs in either Young or Dodge Creek. Sediment delivery to streams is not expected to have a measurable change because no riparian areas would be disturbed, PFIs would not change, and all applicable BMPs would be implemented.

Christmas trees/boughs can be harvested for individual use or commercially on National Forest land. Each of these activities requires a permit. These activities are both current and are reasonably foreseeable within the Analysis Area for the next ten years (approximately 200 acres). Commercial permits include design criteria (i.e. follow INFS direction) to minimized impacts on associated species. This activity does not remove tree overstory or create additional ground disturbance and therefore would not contribute additional effects to Water Resources.

Cattle Grazing

The Analysis Area provides range for one grazing allotment, the West Kootenai Allotment. The Analysis Area encompasses most of the West Kootenai Allotment with the remainder being in the Gold Boulder Sullivan Planning Area. The West Kootenai and Boulder/Scalp Mountain Grazing EA and Decision Notice, which follows Forest Plan direction, provide direction for the management of this allotment. Currently 225 cow/calf pairs are permitted to graze on the West Kootenai allotment from approximately May 15 to September 30. Actual use for the past several years has averaged 180 pairs. Much of the forage in the allotment is transitory and occurs along roads and in harvest openings. Because of topography and vegetation, existing riparian impacts associated with cattle grazing are localized. Steep slopes, deadfall, and dense stands of trees surround most streams, allowing cattle only sporadic access to riparian areas. Most all of the wetlands and ponds within the Analysis Area are not easily accessed by cattle. Locally disturbed sites would continue to be a minor source of sediment delivery and channel instability until they recover. Trends in livestock grazing numbers appear to be stable to declining.

Current and reasonably foreseeable grazing activities within the Analysis Area would not contribute additional effects to PFIs. However, grazing could contribute measurable effects to riparian vegetation and structure, sediment delivery, and/or water quality. Stream monitoring indicates that grazing, at current levels, is not having adverse effects on stream channels and water quality (see Existing Condition above). The effects of livestock grazing on Water Resources are under constant evaluation as part of the allotment management plan. Due to the location and type of activities proposed with this project, no further adverse effects are anticipated and beneficial uses would be protected.

Noxious Weed Treatments

The control of noxious weeds on National Forest land is an ongoing activity that normally occurs from late spring to early fall. Most herbicide treatments are conducted along existing roads; some treatments occur in harvest units. The 2007 Kootenai National Forest Invasive Plant Management ROD provides direction for noxious weed control on the District. Noxious weed control is expected to continue over the next ten years.

This activity is expected to contribute indiscernible effects to Water Resources as defined by the Kootenai National Forest Invasive Plant Management Project (USDA Forest Service 2007). Approved application methods and design criteria would be used. Water quality monitoring has shown that no chemical contamination has occurred. Although new weed infestations may occur due to ground disturbance activities, improvements in treatment chemicals and use of Best Management Practices during timber sale and burning operations should minimize the occurrence and effects of new infestations. The level of noxious weed control within the Analysis Area is not expected to increase much over the next ten years. Therefore, no measureable effects are anticipated.

Wildfire and Fire Suppression

Only one moderate-scale fire has occurred recently within the Analysis Area. The Young J Fire burned over 800 acres in 2000. The probability of a large fire occurring within the next 10 years is considered low due to recent wildfire activity, improved fire detection and suppression techniques, existing transportation system, and recent vegetation management and fuel treatment. A large fire within the Analysis Area could have measurable effects on Water Resources in the future. These effects could include higher sedimentation rates and/or higher nutrient levels. However, due to the unpredictable nature of wildfires, cumulative effects from this natural disturbance could not be meaningfully quantified in this document.

Fire suppression activities would occur as needed and may include the construction of fire lines, helispots, and safety zones by hand or equipment. Effects from wildfire suppression would vary with location and size of the fire; suppression activities are expected to follow Forest Plan direction. Retardants would be used outside of RHCAs when feasible. Suppression of small fires would contribute indiscernible effects to Water Resources within the Analysis Area. The suppression of large fires could have measurable effects to Water Resources. These effects could include bank destabilization and/or bank erosion. However, due to the unpredictable nature of wildfires, cumulative effects from future wildfire suppression activities could not be meaningfully quantified in this document.

Road Management

Routine road maintenance would occur as needed primarily on the 33 miles of road in the Analysis Area. This is separate from any road maintenance identified in this project. Maintenance includes road blading, gate repair/replacement, cleaning ditches and culverts, installing culverts, replacing culverts with larger diameter culverts, installing drain dips and surface water deflectors, placing riprap to armor drainage structures, placement of aggregate, brushing, and debris removal. Road maintenance follows BMPs identified in the Soil and Water Conservation Handbook and INFS direction. Ongoing and reasonably foreseeable road maintenance activities within the Analysis Area could contribute measurable effects to Water Resources, primarily short-term sedimentation rates, within the Analysis Area. However in the long-term, road maintenance reduces the risk of road failures that can contribute large quantities of sediment into live channels by disconnecting storm water flows from streams. No significant changes in road maintenance are expected over the next 10 years.

Recreation Maintenance

Routine maintenance will occur on approximately 10 miles of non-motorized trails in the Project Area. Maintenance may include brushing; removing blowdown, debris, and hazard trees; repairing or adding waterbars; repairing treads; repairing or replacing signs; and improving vistas. Routine trail maintenance would have indiscernible effects to Water Resources because trails are individually small, scattered across many watersheds, and activities are not all occurring in the same year.

Special Uses

Two outfitter/guides are active during the big-game hunting season on the District, and may be active in the Project Area. This activity would have no effect on Water Resources within the Analysis Area and beneficial uses would be protected. Other special use permits include road access to private property, water lines, a gravel pit, Montana Fish, Wildlife, and Parks fish weir, and the West Kootenai Fire Station have no known concerns with regard to Water Resources. The level of special uses within the Analysis Area is not expected to change much over the next ten years.

Public Uses

Recreational use of the Project Area is expected to include hiking, camping, fishing, hunting, photography, small forest product gathering (berries, mushrooms, cones, and boughs), Christmas tree cutting, firewood gathering, driving for pleasure, mountain biking, sightseeing, wildlife viewing, cross-country skiing, snowshoeing, trapping, and snowmobiling. These activities are expected to continue over the next ten years. Because of increasing numbers of people moving into the local communities, it is expected that some of these activity levels would increase. Recreational activities would contribute indiscernible effects to Water Resources within the Analysis Area and would protect beneficial uses. This conclusion is based on the fact that these activities are individually small and scattered across many watersheds. In addition, terms of the firewood cutting permit prohibit cutting within 100 feet of a live channel. This ensures stream banks are protected, LWD is available, and minimizes the potential for sediment production.

Off-highway vehicle (OHV) use was left off the list above because it is currently limited only to existing trails and open roads (OHV Record of Decision and Plan Amendment for Montana, North Dakota, and Portions of South Dakota 2001). Therefore, no additional disturbance is expected from OHV use.

Private Property

It is expected that private land will continue to be developed within the Project Area. Based on information regarding new services provided by Lincoln Electric Cooperative it is expected that an estimated five residences in each 2012 and 2013 would be constructed. The following activities associated with land development are expected to occur: Land clearing from 10 home sites will clear a total of 5 acres and approximately 2.5 miles or 10 acres of access roads would be built.

The construction of roads, clearing of vegetation, construction of residences, and installation of improvements during the development process can create a variety of changes to the landscape. Land development can have varied effects on the aquatic environment depending on the magnitude of the development, the type of development, and the amount of private land on the landscape. Montana State Best Management Practices apply to some of these activities. In consideration of recent trends in land development, the activities on private land could have a measurable effect on Water Resources within the Analysis Area. Approximately 15 ECAs are expected from private land development. These ECAs are included in the Cumulative Effects Analysis below.

State Land

There are no current timber sales on State Land within the Analysis Area. However there is potential that the State could implement an intermediate harvest, or thin, on approximately 50 acres within the next five years. The purpose of the thinning would be to create a fire break adjacent to roads in the area. The thinning would occur for approximately 100 feet on each side of the road along an estimated two miles of road. Timber harvest on State Land could have a measurable effect on Water Resources within the Analysis Area dependent upon timing of the activity. Approximately 6 ECAs are expected from State Land activities. These ECAs are included in the Cumulative Effects Analysis below.

CUMULATIVE EFFECTS TO PEAK FLOW INCREASES

Cumulative effects water yield analysis includes ECAs from past, present, proposed, and reasonably foreseeable activities on federal, state timber, and private lands within each Analysis Area. Effects of timber harvest and road management were incorporated into the cumulative effects analysis of peak flow through consideration of: effects from past, proposed, current, and reasonably foreseeable activities and disturbances; past decisions and analyses; monitoring data; and Forest Plan standards and guidelines. The results of cumulative effects analysis of past, present, proposed, and reasonably foreseeable activities are displayed in Water Table 3-9.

Water Table 3- 9 Changes in Peak Flow by Alternative (% PFI)

Watershed	Forest Plan RPFI	Existing PFI 2006	Existing PFI 2010	Cum Alt. 1 PFI	Cum Alt. 1M PFI	Cum Alt. 2 PFI	Cum Alt. 3 PFI
Young	13	10	8	11	10	8	10
Dodge	13	11	9	13	12	9	13

The PFI numbers displayed in Water Table 3-9 represent the maximum PFI that would occur if all harvest, including the federal, state, and private activities identified above, took place in 2010. Realistically, the harvest on federal lands would not begin until 2011 and activity would be spread over the next 5 to 10 years. In addition the state and private activities would take place in multiple years. All alternatives would have PFIs within historic ranges, meet Forest Plan Standards (identified both in this and previous documents), and would protect beneficial uses. PFIs would remain at or below previous levels of activity. Monitoring has shown these levels have not caused degradation within Young and Dodge Creeks.

CUMULATIVE EFFECTS TO WATER QUALITY

Cumulative effects water quality analysis includes ECAs from past, present, proposed, and reasonably foreseeable activities on federal, state, and private lands. Effects of timber harvest and road management were incorporated into the cumulative effects analysis of water quality through consideration of: effects from past, proposed, current, and reasonably foreseeable activities and disturbances; past decisions and analyses; monitoring data; and Forest Plan standards and guidelines. The findings of this assessment conclude that timber harvest within the Analysis Area would cumulatively contribute indiscernible effects to sediment delivery. Road related activities would cause some short-term increases in sedimentation but an overall reduction in long-term sedimentation. Therefore, water quality within the Analysis Area would be maintained or improved and beneficial uses would be protected.

Timber Harvest and Water Quality

Timber harvest activities have the potential to create soil disturbance and increase overland flow, resulting in soil erosion and sediment delivery to streams. This is primarily due to soil compaction and disturbance associated with skid trails and landings. Past harvest activities are displayed in Map 4 in the Soil and Water Project File.

Research has shown that the level of sediment production resulting from timber harvest is dependent on the level of planning and attention to site-specific conditions (Chamberlin et al 1991). All proposed harvest and fuels treatment activities would be conducted with strict adherence to applicable Best Management Practices. KNF monitoring has shown that BMPs have been properly implemented 97% of the time and have been 95% effective in reducing and/or eliminating sedimentation to streams (USDA Forest Service 2006). A list of BMPs, specific to this project, can be found in Appendix 2. These measures, combined with specified Design Criteria and adherence to INFS Standards and Guidelines for Riparian Habitat Conservation Areas (RHCAs) (USDA Forest Service 1995), are expected to prevent negative impacts on water quality and beneficial uses. Studies of erosion and sediment transport in harvest units have shown that application of BMPs, including installing skid trail drainage and designating riparian buffers, results in sediment retention within the harvest unit and riparian buffer (Croke et al 1999; Wallbrink and Croke 2002; Litschert and MacDonald 2009) and adequately protect streams from sediment introduction. District stream monitoring data displayed in this document combined with District and Forest monitoring of BMP implementation and effectiveness support these findings (USDA Forest Service 2006). Timber harvest activities were designed to protect beneficial uses without required mitigation. The proposed timber harvest activities are not expected to measurably affect sedimentation levels in streams through the use of design criteria, RHCA buffers, and BMPs.

Roads and Sediment

Studies have shown that roads can be the highest contributors of non-point source sediment in forested areas (Brooks et al 1997; Luce and Wemple 2001; Reid and Dunne 1984; Waters 1995), and impact aquatic habitat (Furniss et al 1991; Schnackenberg and MacDonald 1998). A study on the KNF found that fine sediment in channels correlated with road density (MacDonald et al 1997). Map 6 in the Soil and Water Project File displays the roads in the Analysis Area.

The effects of roads on stream systems can be minimized once the interactions of water, soil, vegetation, and topography are understood. Roads can affect streams directly by accelerating erosion and sedimentation, altering channel morphology, and/or changing the runoff characteristics of the watershed (Furniss et al 1991; Gucinski et al 2000). Roads can also intercept groundwater and convert it to surface flow. Water flowing on roads often picks up and carries sediment that is more readily available on non-vegetated native road surfaces. Sediment laden water can be delivered directly into the stream channel where roads cross streams. Asingle road surface gully that forms can contribute large amounts of road-derived sediment to a stream channel. Predicting the probability of these types of failures is difficult. Reducing the likelihood or risk of these occurrences through road maintenance and application of BMP standards protects both the roads and the connected stream systems. Ditch relief culverts in riparian areas can also deliver water and sediment if they carry enough water to scour a channel that eventually connects to a stream. Improperly drained and/or located roads can accelerate erosion rates and increase sedimentation in streams. The frequency and amount of sediment delivery to streams is highly variable and is largely influenced by road segment length, slope, and location within the watershed (Luce and Black 1999; King and Tennyson 1984; Reid and Dunne 1984; Schnackenberg and MacDonald, 1998). BMPs are implemented to reduce and in most cases eliminate these effects by disconnecting ditches from the stream network.

There are 274 miles of existing road within the Analysis Area. Of the total, 199 miles are Forest Service Roads (refer to Map 6 in the Soil and Water Project File). Mass soil movement associated with roads is rare in the Analysis Area, but could occur due to culvert or road fill failure. This project does not propose new road construction. However, proposed road decommissioning, intermittent stored service, and improvements to existing roads may have a measurable effect on reducing sedimentation levels in the Analysis Area watersheds.

Overall Effects on Water Quality

Cumulatively, there is the potential for measurable short-term negative effects and long-term positive effects to water quality (Wegner 1999; Hickenbottom 2001). In addition, over ten years of monitoring has shown that similar levels of activity have maintained or improved conditions within the watersheds (refer to Existing Condition above). The following includes additional rationale for these findings.

Alternatives 1, 1M, and 3 would at least maintain, and probably improve, water quality and beneficial uses throughout the Analysis Area. Road related improvements that include disconnecting ditch water flow from streams are expected to have a positive long-term effect on water quality. The PFIs associated with these alternatives are not high enough to initiate channel erosion and would have no measurable effects on water quality. Application of BMPs for all vegetation management and fuel treatments would minimize effects on water quality.

The road surface drainage improvements that would occur under all action alternatives would reduce the risk of road erosion during extreme events. Even in areas that are not currently eroding, major runoff events could cause enough concentration of flow to initiate road surface gullying, ditch scour, or culvert failure. The BMP improvements in road surface and ditch relief drainage are designed to reduce these risks and to keep storm flows from entering directly into stream channels.

Road decommissioning and intermittent stored service could increase short-term sedimentation during activities but would have a much greater reduction of long-term sediment within the Analysis Area. Road densities would decrease within the Analysis Area.

Alternative 2 would result in no new impacts and no net benefits to water quality. There would be no increases in PFIs and no risk of increased bank erosion. Because there would be no harvest activity, there would be no risk of additional erosion in harvested areas. Road improvements associated with timber harvest would also not occur. Road maintenance would continue and chronic sediment contributions from roads would remain about the same as today. There would be no short-term sediment contributions from intermittent stored service, decommissioning, or recreation projects because these activities would not occur. However, the risk of an extreme runoff event triggering road erosion and culvert failures would remain higher than under the action alternatives.

CUMULATIVE EFFECTS TO STREAM CHANNEL PROCESSES

Stream channel conditions are the culmination of cumulative effects within a watershed. Stream channels are formed and maintained by physical interactions between valley slopes, riparian vegetation, stream flow regime, and channel materials. Over time, stream types can be altered in their pattern and profile by various influences. These influences can affect factors such as stream flow, sediment supply, and channel stability (Rosgen 1996). Management activities such as timber harvest, road construction, and livestock grazing are examples of such influences that can alter stream channel processes and lead to changes in channel processes.

The Rosgen Classification provides management interpretations for various stream types based on sensitivity to disturbance (including increases in stream flow magnitude, timing and/or sediment increases), recovery potential (assumes natural recovery once the cause of instability is corrected), sediment supply (including suspended and bed-load from channel derived sources and/or from adjacent slopes), stream bank erosion potential, and vegetation as a controlling influence for stability (vegetation that influences width/depth ratio). These elements suggest the manner in which channels could respond to disturbance. Water Table 3-10 displays the surveyed stream channel types and management interpretations for streams in the Analysis Area.

Water Table 3- 10 Channel Types and Management Interpretations

Stream	Reach	Channel Type	Sensitivity To Disturbance	Recovery Potential	Sediment Supply	Bank Erosion Potential
Dodge	2	B4	Moderate	Excellent	Moderate	Low
Dodge	4	B4	Moderate	Excellent	Moderate	Low
Young	2	B4	Moderate	Excellent	Moderate	Low
Young	4	B4	Moderate	Excellent	Moderate	Low

When analyzed cumulatively, Alternatives 1, 1M and 3 are not expected to negatively affect stream channel processes and beneficial uses are expected to be maintained or improved. The survey data from Water Table 3-3 and Water Figures 3-1 through 3-3, and 3-10 above show that streams within the Analysis Area are currently stable and in good condition and channels types are all moderately sensitive to disturbance with an excellent recovery potential and a low potential for bank erosion. PFIs are within both historic and Forest Plan ranges and are not expected to initiate adverse channel changes.

Road maintenance, decommissioning and intermittent stored service work would occur under Alternatives 1, 1M, and 3; both with the timber sales and as appropriated funding becomes available. Any stream crossings, whether or not a structure still exists, would be restored to match natural channel form (width, depth, and gradient). Restoration of stream crossings would benefit stream channel function. Road maintenance in Alternatives 1, 1M, and 3 would focus on reducing the distance water flows in ditches, reducing road surface erosion, filtering ditch water before entering streams, and reducing the probability of stream crossing failures. Stream crossing improvements would improve the ability for streams to handle stream flow and sediment that may be restricted in some cases due to undersized structures. With all road work, there would be some short-term sediment introduction from crossing restoration, but the long-term potential sediment yield from each site would decrease (refer to Soil and Water Project File document “Short vs. Long-Term Effects”). No new road construction is proposed.

In summary, Alternatives 1, 1M, and 3 are not expected to adversely affect stream channel processes. This conclusion is based on the analysis of direct, indirect, and cumulative effects to sediment delivery, stream flow, riparian condition, and/or channel stability. Stream channel conditions are expected to be maintained or improved throughout implementation and beneficial uses would be protected.

Alternative 2 would result in no increases in PFIs (Water Tables 3-5 and 3-9). PFIs are within historic ranges and Forest Plan Guidelines. As vegetation continues to grow, PFIs would continue to decrease as well. Because there would be no harvest activity, there would be no risk of additional erosion on harvested areas. Alternative 2 would not implement timber-related road improvements, resulting in no new impacts and no net benefits to water quality. However, regular district road maintenance would continue. Over the 10-year planning period, the condition of the roads would remain nearly the same as the existing condition. The effects of roads on aquatic resources would remain about the same. The risk of road erosion during large events would remain the same as the existing condition. However, the risk of an extreme runoff event triggering road erosion and culvert failures and channel destabilization would remain higher for Alternative 2 than Alternative 1, 1M, or 3.

CONSISTENCY WITH REGULATORY FRAMEWORK

FOREST PLAN DIRECTION

All alternatives are consistent with Kootenai Forest Plan direction for maintaining water quality and protecting wetland and riparian areas. Implementation of any alternative would at least maintain, and action alternatives would likely improve, the support of beneficial uses. For additional information with regard to Forest Plan Monitoring refer to the following website:

http:www.fs.fed.us/r1/Kootenai/publications and look for Forest Plan Monitoring Reports.

COMPLIANCE WITH THE CWA – PROTECTION OF BENEFICIAL USES

The Clean Water Act (CWA) established federal water quality policies, goals, and programs. The objective of the CWA is to “restore and maintain the chemical, physical, and biological integrity of the nations' waters." The Environmental Protection Agency (EPA) and the State of Montana have the responsibility to implement the intent of the CWA. States are required to establish water quality standards that allow for the protection of beneficial uses. Any action within a given watershed should maintain or improve stream conditions within that watershed. ***All alternatives comply with the CWA. Each alternative is expected to maintain or improve stream conditions in the Analysis Area. This expectation is based on: surveys of existing watershed conditions; the conclusion of the Water Yield analysis that PFIs would not exceed recommended levels; the designation of RHCAs, the application of BMPs to all proposed road work, timber harvest and underburning activities; evidence from Forest monitoring results and the literature regarding the effectiveness of BMPs; and the conclusion that the effects of BMP improvements to roads would reduce existing water and sediment contributions from the road network.***

In a Memorandum of Understanding (MOU) between the Forest Service and the State of Montana, the Forest Service has been designated as the management agency responsible for water quality protection on National Forest System lands. In the MOU, the Forest Service has agreed to follow State Water Quality Standards established under the Montana Water Quality Act, primarily through implementation of BMPs. These are designed to ensure that water quality and beneficial uses are protected both during and after implementation of land management activities. ***The FSEIS (Appendix 2) and Soil and Water Project File outline the BMPs designated for each potential activity. These measures are fully expected to minimize soil disturbance and erosion. The 2011 KNF Monitoring Summary (USDA Forest Service 2011) states that monitoring between 1991 and 2011 shows that 95 percent of the BMPs implemented during that time were effective. Road drainage improvements are designed to disconnect storm water flow from the stream network. The improvements are expected to reduce chronic sediment delivery in the long term, which is expected to maintain or improve aquatic habitat conditions and Young and Dodge Creeks. Based on Wegner (1999), a measurable decrease in percent fine sediment in pool tails is expected. The monitoring plan for this Analysis Area is outlined in FSEIS Appendix 3.***

The CWA requires states to identify waterbodies that do not fully support all their designated beneficial uses. These impaired waterbodies are called Water Quality Limited Segments (WQLS). ***There are no WQLS streams within the Analysis Area. Implementation of the proposed activities, including the Design Criteria and BMPs specified in the EA and Soil and Water Project File, would at least maintain beneficial use conditions and may improve them.***

COMPLIANCE WITH PROTECTION OF RIPARIAN AREAS AND WETLANDS

The Riparian Area Guidelines in Appendix 26 of the Forest Plan (USDA Forest Service 1987b), as amended by the Montana Streamside Management Zone (SMZ) Law and INFS (USDA Forest Service 1995), provide standards and guidelines for activities in riparian areas and wetlands. ***These regulations would be strictly followed during sale design and layout and any other action resulting from the decision.***

Section 404 of the CWA authorizes the Secretary of the Army to issue permits for the discharge of dredged or fill material into wetlands (33 CFR 323). Silvicultural activities are exempt from the 404 permit process, as are associated road construction and maintenance that adhere to BMPs (33 CFR 323.4a). ***Silvicultural treatments and roadwork near wetlands would be done in accordance with the KNF Riparian Guidelines, as amended by the Montana SMZ Law and INFS.***

FISHERIES

INTRODUCTION

This section outlines the results of the analysis for the biological aspects of the Aquatic Resources in the Young Dodge Analysis Area. Supporting documentation of the following findings is available in the Fisheries section of the Project File.

REGULATORY FRAMEWORK

Endangered Species Act

The Endangered Species Act (ESA) of 1973 declares that "...all Federal departments and agencies shall seek to conserve endangered species and threatened species and shall utilize their authorities in furtherance of the purposes of this Act." Under the Act, Federal agencies must consult with the Secretary of the Interior whenever an action authorized by such agency is likely to affect a species listed as threatened or endangered. Bull trout and white sturgeon are currently listed as threatened and endangered, respectively, under the ESA.

National Forest Management Act

On December 18, 2009 the Department of Agriculture issued a final rule reinstating the National Forest System Land and Resource Management Planning rule of November 9, 2000, as amended (2000 rule) (74 FR 242 [67059-67075]). The 2000 rule states: Projects implementing land management plans must comply with the transition provisions of 36 CFR §219.35, but not any other provisions of the planning rule. Projects implementing land management plans must be developed considering the best available science in accordance with §219.35(a). Projects implementing land management plans must be consistent with the provisions of the governing plans. Based on the reinstated 2000 planning rule this project level analysis:

1) Considers the best available science in evaluating the effects on the species and

2) Considers how the action complies with applicable standards and guidelines in the KNF land management plan.

In addition, the analysis considers how the action provides for diversity of plant and animal communities based on the suitability and capability of the specific land area in order to meet overall multiple use objectives, and within the multiple use objectives of a land management plan adopted 16 USC 1604 (g)(3)(B).

The Kootenai National Forest provides habitat for over 300 different species of fish and wildlife (KIPZ Analysis of the Management Situation, USDA Forest Service 2003b: 45, 59-64), many of which occur on the Rexford Ranger District and within the Young Dodge Analysis Area. The presence or absence of these fish and wildlife species depends on the amount, distribution, and quality of each species preferred habitat. In addition to habitat changes, many of these species are impacted by fishing, hunting or trapping. Montana Fish, Wildlife & Parks (MFWP) regulates fish and game populations. The Forest Service and the MFWP work together to ensure that an appropriate balance is maintained between habitat capability and population numbers.

Sensitive species are managed under the authority of the National Forest Management Act and are administratively designated by the Regional Forester (FSM 2670.5 Kimbell 2004). Sensitive aquatic species identified to exist on the Kootenai National Forest include interior redband trout (*Oncorhynchus* *mykiss gairdneri*), westslope cutthroat trout (*O. clarki lewisi*), and western pearlshell mussel (*Margaritifera falcata*). The interior redband trout does not occur in the Project Area, as its historic distribution lies south and west of this Project Area, and is therefore not considered in further detail. State-wide distribution of westslope cutthroat trout and western pearlshell include the majority of western Montana and some portions of the upper Missouri River drainage in central Montana. Habitat and population trends of westslope cutthroat are discussed further in the Fish Habitat and Population sections below. No western pearlshell have been documented within the Analysis Area. Habitat conditions for western pearlshell within the Analysis Area are discussed in the "Existing Condition and Trend" section below.

Executive Order 12962 (USDA Forest Service1995a) mandates disclosure of effects to recreational fishing.

Kootenai Forest Plan

The Kootenai Forest plan (USDA Forest Service 1987) provides direction for meeting the requirements of the NFMA in its forest-wide goals and standards in chapter 1 (Volume 1) and in the Management Area (MA) direction in chapter III (Volume 1). The plan contains an overall forest-wide goal to provide sufficient quality and quantity of habitat for various species or groups of species within the suitability and capability of the Forest.

The Inland Native Fish Strategy (INFS) amended the Kootenai Forest Plan in 1995 (USDA Forest Service 1995b). INFS establishes stream, wetland and landslide-prone area protection zones called Riparian Habitat Conservation Areas (RHCAs), setting standards and guidelines for managing activities that potentially affect conditions within the RHCAs. INFS also established Riparian Management Objectives (RMOs) that provide guidance with respect to key habitat variables.

ANALYSIS AREA

The Young Dodge Analysis Area lies in the northwest corner of the Rexford Ranger District. The Analysis Area includes two major fish-bearing streams, Young and Dodge Creeks, along with several other streams that drain into Canada, a closed basin, or drain directly into Koocanusa Reservoir. These streams do not have fish. This analysis will focus on Young and Dodge Creeks, the two fish-bearing streams within the Project Area.

Young Creek, the northern-most drainage, is a 17,394-acre watershed that provides fish habitat from its confluence with the Kootenai River upstream to the headwater areas. The lower portion of the stream likely had westslope cutthroat trout (*Oncorhynchus clarki lewisi*), bull trout (*Salvelinus confluentus*), large-scale sucker (*Catostomus macrocheilus*), and torrent sculpin (*Cottus rhotheus*). Further upstream, it is likely that only the cutthroat and bull trout were present. Lake Geneva was likely barren due to limited connectivity to Young Creek, which lies at its headwaters.

Today, Young Creek supports a resident population of non-native eastern brook trout (*Salvelinus fontinalis*), rainbow trout (*Oncorhynchus mykiss*), and spawning habitat for one year-class of spawning kokanee salmon (*Oncorhynchus nerka*). Native westslope cutthroat trout occupy the upper reaches, while bull trout, another population of cutthroat trout, and an occasional large-scale sucker occupy the lower reaches. Some cross-breeding between rainbow and cutthroat trout is likely occurring in the middle reaches, but genetic analysis of the 303 Road section (upper reach) indicates pure-strain westslope cutthroat trout presence. Results of genetic analysis suggest that the lower and upper Young Creek populations are similar, but separate populations (Knudsen 1999). That is not to say that fish from these separate populations do not interbreed, but genetic exchange appears limited.

Dodge Creek lies south of Young Creek, and is a 10,587-acre watershed. Dodge Creek likely had similar fish species composition to Young Creek up to the natural waterfall at the present day high water mark on Koocanusa Reservoir. Another waterfall exists approximately 1700m upstream of the current reservoir. The portion of stream above the present-day reservoir was likely fishless due to the natural lack of connectivity.

Currently Dodge Creek contains a resident population of non-native eastern brook trout on both sides of the waterfall barrier. This is likely due to legal or illegal fish plants that have occurred over time. A resident population of westslope cutthroat trout inhabits the upper portion of the stream, with a few scattered fish in the lower portion of the stream below the waterfall.

Several lakes occur within the Analysis Area. Lake Geneva, below Robinson Mountain, is planted with cutthroat trout by Montana Fish, Wildlife, and Parks and is a destination for recreationists. The remaining lakes were found to be fishless, based on field reconnaissance. Lake Geneva will not be further analyzed due to a lack of activities around the lake.

The fish distribution map (MAP 3-8) for the Analysis Area is based on field survey data collected since 1994. Those stream segments identified as fish-bearing during field surveys will be the focus of the analysis for effects to the fisheries resource.

METHODOLOGIES

The existing condition for the aquatic habitat in Young Creek was determined through basin-wide fish habitat surveys conducted in 1998 and 2004, and reach monitoring surveys in 2006 (2 sites). In Dodge Creek, basin-wide fish habitat surveys were conducted in 2000 and 2004, with reach monitoring surveys at two sites in 2006. The basin-wide survey methodology was modified slightly from the R1/R4 Fish and Fish Habitat Standard Inventory Procedures Handbook (Overton et al 1997). The reach monitoring survey protocol was adapted from the draft Region 1 Aquatic Ecosystem Unit Inventory (R1 AEUI) Technical Guide (unpublished 2006). These survey methodologies are mostly comparable, as the parameters are measured in the same manner or similarly. However, summary results displayed in Fisheries Table 3-1 for the two earlier surveys are not comparable to data from the 2006 surveys because they represent reach means, while the 2006 survey results represent means from the monitoring site surveys. It is not valid to extrapolate monitoring site values to the larger reaches. However, these surveys are more useful for future comparisons of data collected from the same monitoring sites (Roper et al 2003).

Surveys for western pearlshell were conducted simultaneously with the fishery habitat surveys. Conducting both surveys simultaneously allows the crew to scan the majority of the sample reach for mussels while recording substrate measurements, taking depths of habitat units, and determining percent fine sediment with the Aquascope.

Fish population surveys were conducted on various sites by MFWP or Forest Service personnel. Standard multiple-pass depletion methodologies were utilized at all sites.

AFFECTED ENVIRONMENT

Habitat conditions for this project were based on past fish habitat surveys and compared to default Riparian Management Objective (RMO) values established in INFS (Fisheries Table 3-1). Overall attainment for each stream and survey year is displayed in Fisheries Table 3-2. By providing suitable habitat within the Analysis Area, NFMA and Forest Plan compliance would be attained. NFMA and the Forest Plan provide protection for native and desired non-native fishery resources.

Cutthroat trout, especially westslopes, as well as non-native rainbow and eastern brook trout are specifically protected under NFMA within the Project Area. Additionally, bull trout are protected by the ESA. Effects to westslope cutthroat trout and bull trout are displayed later in the Fisheries section.

AQUATIC HABITAT DATA

Fisheries Table 3-1. Physical Riparian Management Objectives and Project Area Stream Data

Stream	Reach	Year	RMO Pool (#/km)	Pool (#/km)	RMO LWD (#/km)	LWD (#/km)	RMO Bank Stability (%)	Bank Stability (%)	RMO Wetted Width/Depth Ratio	Wetted Width/Depth Ratio
Young	1	1998	>35	**28**	>13	47	>80%	94.9	<10	**25**
Young	1	2004	>35	40	>13	206	>80%	93.4	<10	**29**
Young	2	1998	>35	45	>13	101	>80%	96.4	<10	**28**
Young	2	2004	>35	**28**	>13	184	>80%	98.3	<10	**28**
Young	2	2006	>35	43	>13	112	>80%	94.0	<10	**36**
Young	4	1998	>35	**21**	>13	44	>80%	97.2	<10	**28**
Young	4	2004	>35	**26**	>13	186	>80%	93.5	<10	**32**
Young	4	2006	>35	**23**	>13	83	>80%	**73**	<10	**36**
Dodge	1	2000	>35	51	>13	165	>80%	98.4	<10	**27**
Dodge	1	2004	>35	40	>13	229	>80%	98.2	<10	**22**
Dodge	2	2000	>35	49	>13	177	>80%	99.2	<10	**26**
Dodge	2	2004	>35	49	>13	272	>80%	98.6	<10	**25**
Dodge	2	2006	>35	68	>13	598	>80%	99	<10	**27**
Dodge	3	2000	>35	43	>13	160	>80%	99.8	<10	**24**
Dodge	3	2004	>35	40	>13	263	>80%	99.1	<10	**26**
Dodge	4	2000	>35	**33**	>13	151	>80%	98.8	<10	**26**
Dodge	4	2004	>35	47	>13	297	>80%	96.3	<10	**25**
Dodge	4	2006	>35	75	>13	150	>80%	99	<10	**20**
Dodge	5	2000	>35	**21**	>13	125	>80%	99.9	<10	**25**
Dodge	5	2004	>35	42	>13	251	>80%	98.1	<10	**24**

Bold values indicate that the average exceeds the INFS RMO

Fisheries Table 3-2. Overall Riparian Management Objective Attainment by Year

Stream	Year	Physical Habitat Attainment
Young	1998	58% (7/12)
Young	2004	58% (7/12)
Young	2006	50% (4/8)
Dodge	2000	65% (13/20)
Dodge	2004	75% (15/20)
Dodge	2006	75% (6/8)
Managed/PIBO*	**1998-2004**	**52% (N=265)**
Reference/PIBO*	**1998-2004**	**53% (N=92)**

*PIBO data comes from Henderson et al 2005 "PIBO Effectiveness Monitoring Program Seven-Year Status Report 1998 Through 2004".

An April 2008 report sent out by the PACFISH/INFISH Biological Opinion Monitoring Program (PIBO EM) stated that an analysis of 252 integrator reaches (the first sample location within each watershed), including 73 reference (minimally managed) sites found that "(N)o stream sampled by PIBO EM met the whole suite of the interim PACFISH/INFISH RMO values" (Archer and Roper 2008). Data collection performed on over 80 reaches of the Rexford District has yet to yield a wetted width/depth ratio value of less than 10, further supporting that conclusion at the District level. The PIBO EM report also stated that, "It was not assumed that interim RMOs, or ones that were refined using better information, would be met but rather achieved over time, not used as absolute values to be achieved now or in the future." Attachment A of the INFS Decision Notice (which amended the Forest Plan) echoes this statement on page A-3. Previously on page A-2 it also states, "It has been determined that the Riparian Management Objectives described in PACFISH are good indicators of ecosystem health. … With the exception of the temperature objective, which has been modified, the RMO's represented a good starting point to describe the desired condition for fish habitat." Fisheries Table 3-2 also shows that only Young Creek in 2006 had lower RMO attainment than the mean attainment for the 73 reference watersheds in the PIBO EM data set.

Only about 3% of streams in the PIBO EM data set meet the wetted width/depth ratio RMO. None of the Analysis Area streams meet that RMO. Only the Young Creek Reach 4 site had lower overall RMO attainment than reference streams. The Young Creek Reach 4 permanent monitoring site contains an over-steepened cobble bar that has existed since the first surveys were done in this reach. However, because of the much shorter reach length surveyed in 2006, this particular 64-foot section of stream bank accounts for nearly 15% of the reach length (versus <1% of the earlier surveys). This section is also deficient in pools, compared to the default RMOs. Although this reach does not meet the RMO for pools, pool numbers have been stable throughout the sampling period. However, fish population estimates, displayed in Fisheries Figure 3-3, show fish numbers near historic highs during the sampling period, despite the pool deficiency. Re-measurement of the permanent monitoring reaches will be much more sensitive to detecting changes during future survey efforts. It is also not valid to directly compare 2006 survey results to earlier surveys. These results were only displayed to show RMO attainment within the surveyed site. These results cannot be extrapolated to the larger reach.

Fisheries Table 3-3. Seven-Day Maximum Temperature Monitoring Results

Stream/Reach	1994	1996	1997	1999	2000	2001	2002	2003	2004	2005	2006
Dodge/1	-	15	**16**	15	**17**	**18**	**15.5**	**18.3**	13	**16.7**	*
Young/1	15	**16**	-	-	**18.7**	**19.4**	-	-	13.3	-	*
Dodge/2	-	-	-	-	-	-	-	-	-	-	14
Dodge/4	-	-	-	-	-	-	-	-	-	-	12
Young/2	-	-	-	-	-	-	-	-	-	-	**18**
Young/4	-	-	-	-	-	-	-	-	-	-	12

Bold values indicate that the average exceeds the INFS RMO. * These sites were replaced by reach-specific sites.

The seven-day maximum temperature data has historically been collected by stream at one location lower in the drainage (Fisheries Table 3-3). In 2006, the District adopted the R1 AEUI protocol and began collecting temperature data at each reach-level monitoring site. The lower temperatures in Dodge 4 and Young 4 are typical of higher elevation streams. The results of the 1994-2006 monitoring indicate that these streams receive more thermal heating than is desired for streams with bull and cutthroat trout. However, the data are similar to other streams where little or no riparian management occurs on the Rexford Ranger District (see Temp_all.xls in Project File).

FISH POPULATION DATA

Fish population data has been collected in a variety of ways over the years within the Analysis Area. Most of the data is from electrofishing efforts, although migratory trap and stocking data were also utilized in this analysis. Montana Fish, Wildlife, and Parks personnel collected population estimate information through electrofishing surveys in Young Creek. Migratory trap data was utilized to determine possible species that may be found in Young Creek, mostly seasonal migrants from Koocanusa Reservoir. Forest Service crews collected Dodge Creek population estimate data using electrofishing techniques. Data from Lake Geneva comes from MFWP stocking records and field visits. Fisheries Figures 3-1 through 3-5 display population estimate values, by species, for Young and Dodge Creeks.

THREATENED AND ENDANGERED SPECIES

KOOTENAI RIVER WHITE STURGEON

Kootenai River white sturgeon are listed as endangered. However, due to ongoing consultation with the US Fish and Wildlife Service (Wilson 2001), it was determined that projects above Libby Dam have no effect on white sturgeon, therefore this species will not be considered further.

BULL TROUT

Bull trout are currently listed as threatened (Wilson 2007). Bull trout are only found in Young Creek within the Analysis Area. The historic extent of use has not likely changed much in Young Creek over time, but the number of fish that utilize the stream may have declined over the years because the lower reach of Young Creek was flooded by Koocanusa Reservoir. Fish appear to use the lower extent of Young Creek opportunistically, with no evidence of spawning found there. Spawning generally occurs in the Elk and Wigwam Rivers in British Columbia, Canada or in Grave Creek in Montana. Bull trout habitat conditions for this project were based on the previously discussed habitat surveys and compared to default Riparian Management Objective (RMO) values established in INFS. Fisheries Table 3-1 displays the default RMO values and values for Young and Dodge Creeks.

The final rule designating bull trout critical habitat did not designate any critical habitat within the Analysis Area. For that reason effects to bull trout critical habitat will not be considered in this analysis.

Description of the Population within the Analysis Area

Historically, bull trout were likely opportunistic inhabitants of Young Creek. Although most of the mainstem is accessible, widespread use of this stream is unlikely. Electrofishing and migratory trap data indicate that juvenile bull trout utilize this stream. No spawning has been detected in Young Creek and no fry have been documented. Most use in this stream appears to be incidental and opportunistic, as supported by the few fish that have been sampled over the years.

Environmental Baseline – Species Indicators and Habitat Indicators

The following species indicators refer to the entire Young Creek "population". The Young Creek "population" likely spawns in Grave Creek or in Canadian tributaries to Koocanusa Reservoir. As noted above, use is likely incidental and no reproducing population exists in Young Creek.

1) *Subpopulation Size:* No redds have been found in Young Creek. This stream likely provides limited thermal refugia during the summer months. This indicator is *functioning at risk* based on higher stream temperatures in the lower reaches, where bull trout are more common.

2) *Growth and Survival:* There is insufficient data to determine growth and survival rates for the Young Creek "population". This characteristic is assumed to be *functioning* as it provides connected habitat that is being used, although sporadically.

3) *Life History Diversity and Isolation:* Young Creek provides temporary habitat for bull trout residing in Koocanusa Reservoir. This small, but connected, piece of habitat is utilized by fish on occasion and provides thermal refugia and feeding opportunities for some fish. For these reasons, it is assumed that this characteristic is currently *functioning*.

4) *Persistence and Genetic Integrity:* Young Creek provides connected habitat that provides some fish with a summer refuge from warm reservoir temperatures. Since there are no threats to the connectivity with Koocanusa Reservoir, this characteristic is *functioning*.

DESIRED NON-NATIVE AND SENSITIVE SPECIES

EASTERN BROOK TROUT, RAINBOW TROUT, WESTSLOPE CUTTHROAT TROUT, AND WESTERN PEARLSHELL

Desired non-native aquatic species are managed under the authority of NFMA (PL 94-5888). The non-native species in the Analysis Area are eastern brook trout and rainbow trout, which are valued as a recreational fishery. Based on a coarse screen population viability analysis (Rieman et al 1993), eastern brook trout would continue to persist under any alternative considered in this document (see Project File). This species is quite hearty, and acts as an invader species. Viability analysis was not conducted with rainbow trout, as they are a minor portion of the fish composition and there is thought to be a high degree of hybridization where they do occur.

Sensitive species are those listed where population viability is a concern due to significant declining population numbers, density, distribution, or habitat capability throughout their range. They are managed under the authority of NFMA (PL 94-5888), and are administratively designated by the Regional Forester (FSM 2670.5 Kimbell 2004). Sensitive aquatic species known or suspected to occur on the KNF, and their status in the Analysis Area, are shown in Fisheries Table 3-4. Redband rainbow trout are not found upstream of Libby Dam and therefore, will be eliminated from further consideration and analysis.

Western pearlshell have never been documented in the Analysis Area, despite fairly intensive fish habitat sampling within the Area (see Project File), therefore they will be eliminated from further consideration and analysis.

Fisheries Table 3- 1 Sensitive Aquatic Species and Status

Species	Forest Status	Analysis Area Status
redband rainbow trout	Known	Not Known
westslope cutthroat trout	Known	Known
western pearlshell	Known	Not Known

Westslope cutthroat trout are known to occur within the Analysis Area and were further evaluated for occupancy, viability (Project File), effects of proposed activities, and to determine if further biological investigation is needed. This document serves as the biological evaluation for this species.

Western pearlshell mussels have declined in abundance and distribution from historic levels, partially due to effects from human alterations of waterways (e.g., dredging, channelization), entombment from excessive sedimentation, declining water quality, and loss of suitable host species for the parasitic larval stage (Vannote and Minshall 1982). Western pearlshell have not been documented in the Analysis Area; however, suitable habitat may be present. Preferred habitat for the western pearlshell includes rivers and streams with relatively stable hydrographs and gradients of ~2% or less (Stagliano 2010). Preferred substrate for western pearlshell is gravel or gravel interspersed among boulders, likely for protection from scouring flows (Stagliano 2010). Comparisons between preferred western pearlshell habitat and current habitat conditions in the Analysis Area are presented in the “Existing Condition and Trend” section below.

Fisheries Table 3-4. Sensitive Aquatic Species and Status

Species	Forest Status	Analysis Area Status
Redband rainbow trout	Known	Not Known
Westslope cutthroat trout	Known	Known
Western pearlshell	Known	Not Known

EXISTING CONDITION AND TREND

Young and Dodge Creeks have both been shown to have genetically pure westslope cutthroat trout (Kanda 2000; Knudsen 1999). The lower reaches of Young Creek are showing the effects of brook trout invasions, as the overall species composition at the lower sample sites shifts toward brook trout as the dominant species. Due to this downstream source, the upper sample site is also showing evidence of invasion. Dodge Creek is similar, except that the lower reaches are almost entirely brook trout, while the upper reach has had high brook trout composition for several years. This stream appears to be in a more advanced stage of invasion. Specific habitat information is documented in the above sections. Population information is displayed below in Fisheries Figures 3-1 through 3-5.

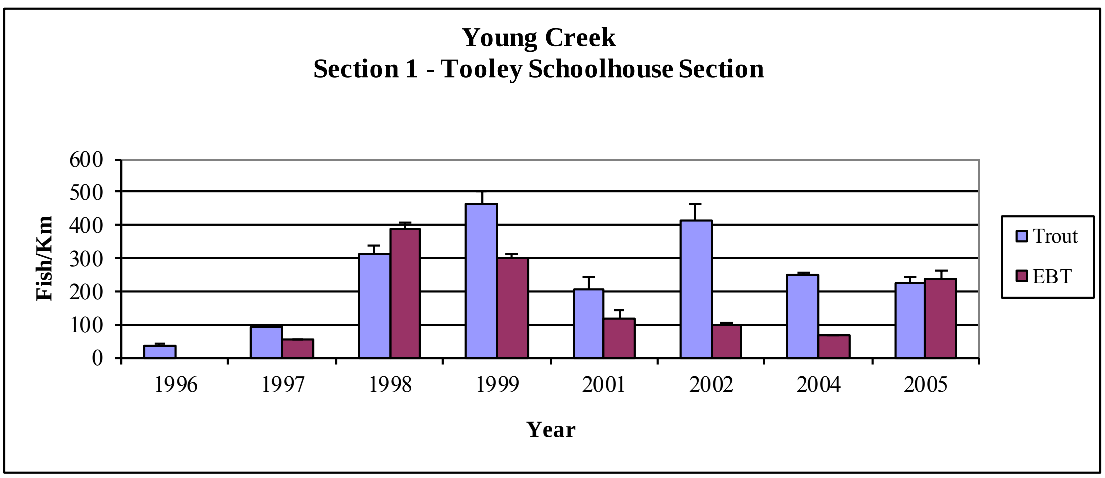
The westslope cutthroat trout (WCT) population appears to be somewhat stable in the upper section (303), comprising 94-100% of past samples. Eastern brook trout (EBT) have had far more impact on the lower sections (State and Tooley Schoolhouse), where they have gone from invasion to 55% of the population (1998), down to 20% of the population by 2002, and back to 51% in 2005. The State section went from 27% EBT to 16% between 1998 and 2003. Following channel restoration activities in 2004, EBT jumped to 34% of the sample in 2004 and 48% in 2005. The 303 site is currently being invaded by EBT and EBT composition is expected to increase as they become established.

Dodge Creek is dominated by EBT throughout the stream. Reach 2 had one WCT in 2006. This reach has historically been inundated with fine sediments, partly caused by the ford crossing upstream of the Reach 2 Monitoring Site. This condition is expected to improve as a bridge was placed at the crossing site in 2006, removing a major sediment source to Dodge Creek. Reach 4 samples have been predominately EBT, with the exception of 1999 (53% WCT). EBT have comprised as much as 68% of the sample (2006). Similar findings were cited in studies on WCT and EBT competition (Shepard 2004; Peterson and Fausch 2003; and Peterson, Fausch, and White 2004).

It is important to recognize that fish population estimates are not only affected by changes in habitat, and competition between species, but also respond to changes in fishing pressure. Recent increases in limit sizes on eastern brook trout established by MFWP, and changes to fishing regulations (Young Creek was closed to fishing from 1988 to 1993) have also had some impact on fish numbers.

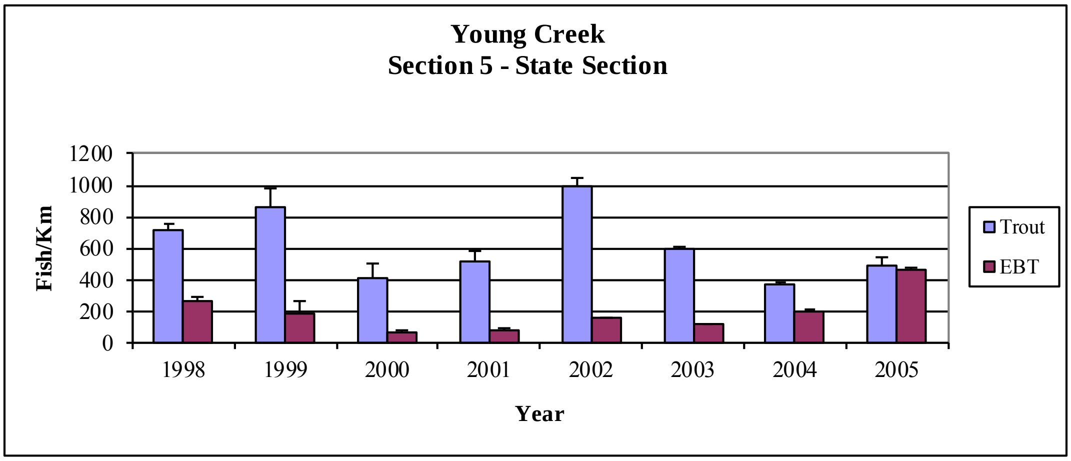
In the four sample sites where multiple years of information are available, the last year of sampling showed that total fish populations were somewhere between the extremes in the sampled years. This would indicate that the population is relatively stable within a fairly broad range of estimate values. These fluctuations are normal for small stream populations that are influenced by floods, droughts, competition between and among species, and fishing pressure. In all sample sites, the last population samples showed more fish than occurred in the first samples of the same site, indicating a long-term upward population trend in all four sites that had multiple samples.

Fisheries Figure 3-1. Young Creek Population Estimate Site, Tooley Schoolhouse Section

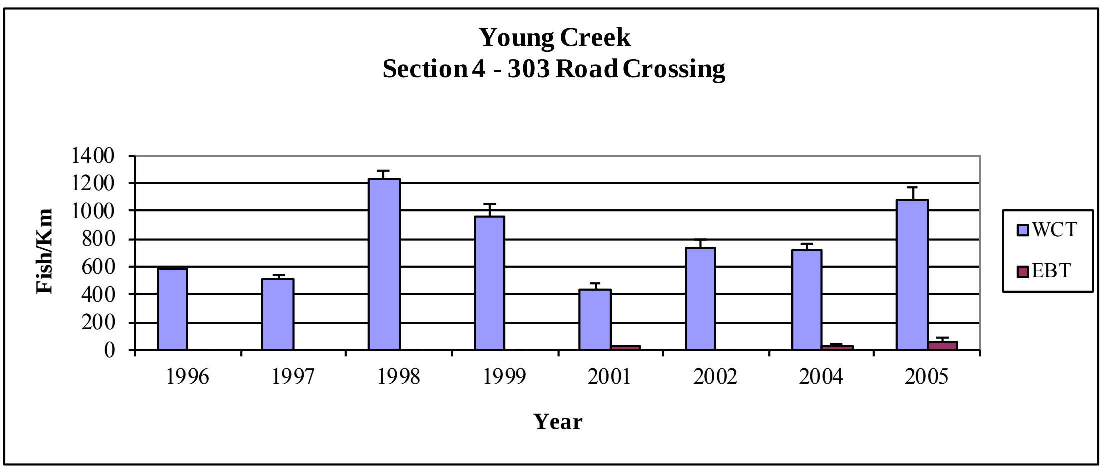


Trout = rainbow and cutthroat were not differentiated on some data sheets, so they were lumped together.

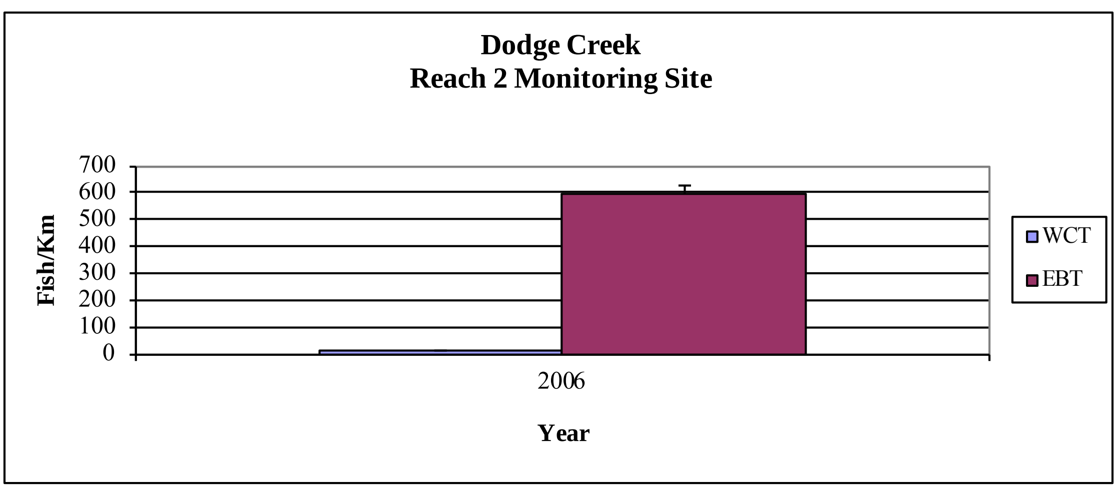
Fisheries Figure 3-2. Young Creek Population Estimate Site, State Section



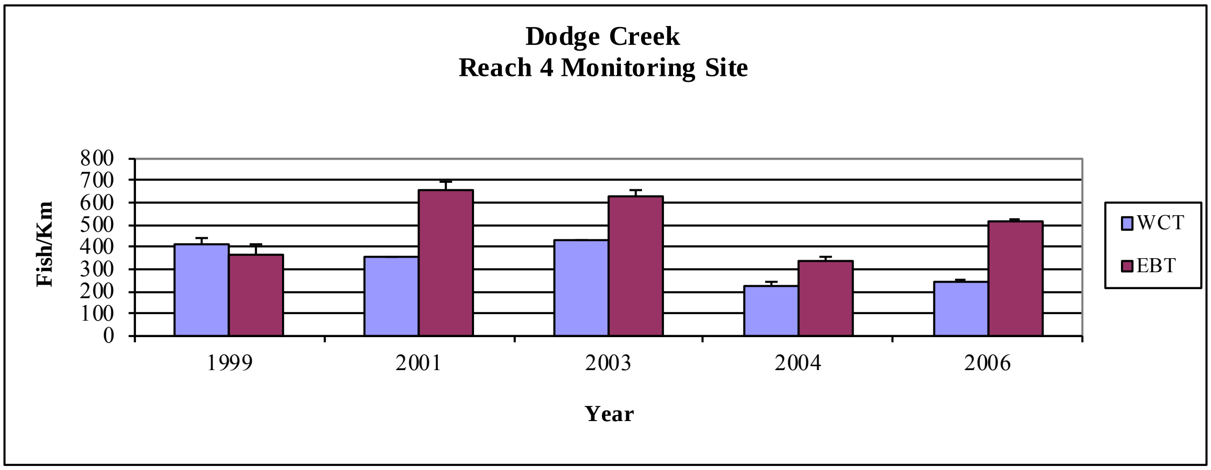
Fisheries Figure 3-3. Young Creek Population Estimate Site, 303 Road Section



Fisheries Figure 3-4. Dodge Creek Population Estimate Site, Reach 2 Monitoring Site



Fisheries Figure 3-5. Dodge Creek Population Estimate Site, Reach 4 Monitoring Site



Lake Geneva is the only lake known to support a fishery within the Analysis Area. Montana FWP planned to stock westslope cutthroat trout in the lake in 2000 (Vashro 1998) and stocking records indicate that westslopes were stocked in July of 2005 (MFWP 2005). This site is managed as a put-and-take fishery by MFWP.

Preferred habitat for western pearlshell include rivers and streams with relatively stable hydrographs and gradients ~2% or less (Stagliano 2010). Preferred substrate for western pearlshell is gravel or gravel interspersed among boulders, likely for protection from scouring flows (Stagliano 2010).

Aquatic habitat in the lower reach (approximately 3 miles) of Young Creek appears suitable for western pearlshell. Gradient in this section of Young Creek is 2.2%, slightly higher than, but close to, the preferred range of stream gradients for western pearlshell. Approximately 50% of the substrate in this section is composed of gravel-sized (2-64 millimeter) material, indicating abundant preferred substrate for western pearlshell. In addition, flows in Young Creek are relatively stable (R2 value of 0.97 for the stage/discharge relationship; see "Stream Flow Monitoring" in the Water Section of Chapter 3 for more information). Cumulatively, aquatic habitat conditions in lower Young Creek appear conducive to western pearlshell colonization, although it is unknown whether the species was historically present in the watershed. Dodge Creek (within the Analysis Area) likely never supported any western pearlshell due to a natural waterfall at the present day high water mark of the reservoir. Given that western pearlshell use host fish to distribute larvae upstream in watersheds, the presence of a fish barrier (waterfall) suggests there were likely no western pearlshell above this barrier, historically.

ANALYSIS OF DIRECT AND INDIRECT EFFECTS

The direct and indirect effects Analysis Area is described under the Analysis Area section. This section considers the addition of proposed management activities to the existing condition. Bull trout and westslope cutthroat trout are the only threatened, endangered, or sensitive fish species found in the Analysis Area. Westslope cutthroat trout will be the species used to determine the effects of the alternatives on the fishery resource because it is the most sensitive species with a large enough population to measure effects against. Proposed activities will be analyzed for effects to aquatic habitats and cutthroat trout population numbers. Activities, individually or cumulatively, that do not degrade habitat or population numbers are allowable under NFMA and the Forest Plan.

Alternative 2 does not propose any management activities within the Analysis Area and therefore, would not produce any direct effects to the fisheries resource. Existing conditions and trends are expected to continue through time under this alternative, as natural recovery would continue. These trends include maintaining the existing level of RMO attainment and current fish habitat levels in all Analysis Area streams. With this alternative, it is expected that vegetative recovery from past management activities would allow peak flow levels to decrease below current levels.

Indirect effects associated with Alternative 2 include continued sediment input from existing sources to those streams with fish populations and the risk of stream-crossing failures that could send relatively large amounts of road fill into streams, with potential adverse impacts to fish. However, current stream conditions show little sign of excess sedimentation (refer to the Water Resources Section).No other direct or indirect effects are anticipated with Alternative 2 because: 1) no additional disturbance is proposed under this alternative; 2) no sediment would be contributed to streams from road reconstruction or maintenance activities (culvert replacement or removals); and 3) no changes to peak flows would occur, other than recovery. Given existing habitat and population conditions, including a population viability analysis (Project File; Rieman et al 1993), it is likely that fish populations would continue to persist under this alternative.

There are no measurable direct effects to fish or aquatic habitat anticipated with the implementation of Alternatives 1, 1M, or 3. No activities proposed in any action alternative would directly affect fish or aquatic habitat within the Analysis Area. Direct effects to fish are rare during management activities because activities are rarely conducted directly in occupied aquatic habitat. Indirect effects are more common due to downstream and hill slope processes that move effects from one activity area to areas of occupied aquatic habitat (i.e. sediment transport from a road to a stream, down a stream, etc.).

Alternatives 1, 1M, and 3 propose various levels of harvest within the Analysis Area. Stream flow modeling and analysis show that peak flows would remain within historic ranges under any action alternative. Water Table 3-4 in the Water Resources section displays the expected peak flow increases for each alternative. No measurable indirect effects to the aquatic resource are expected with these levels of peak flow increases because they are at or lower than in the recent past and within historic ranges (Water Table 3-4). In addition, peak flows within historic ranges are not expected to alter potential habitat for western pearlshell mussels. Monitoring has shown that these past increases did not cause any long term losses of either aquatic habitat or fish populations (Water Figures 3-1 through 3-3, Water Table 3-3, Fisheries Tables 3-1 and 3-2, and Fisheries Figures 3-1 through 3-5).

Placing roads in intermittent stored service, decommissioning, and maintenance activities would have short-term sediment inputs, as culverts are removed or replaced. Off-channel sources are expected to take one to two years to heal after the work is completed based on Hickenbottom's monitoring (2001) of road re-contouring on the Lolo National Forest. Wegner's (1999) monitoring of culvert removals on live channels on the Kootenai NF indicates that in-stream sediment increases are short-lived with total suspended sediment resembling background levels within 48 hours of the completion of work. These activities are not expected to cause short-term detrimental impacts to aquatic habitat due to the limited scope of these activities. The long-term effects from these activities are expected to benefit aquatic habitat by restoring natural drainage patterns and reducing the risk of future road failures. Therefore, no measurable changes in aquatic habitat are expected with these alternatives.

Proposed activities would occur in RHCAs only to improve their conditions. Where these RHCA boundary modifications are made, at a minimum, all applicable Streamside Management Zone laws would be met. This means that, depending on stream type, there would still be a 50' or 100' no-activity buffer around each stream. Improvements to RHCA conditions are accomplished by removing excess fuel loadings to reduce future fire risk; reducing shade on the outer edges of the riparian area to provide more sunlight for plant growth, especially for riparian shrubs; making additional riparian trees more susceptible to wind and therefore increasing the chance that more large woody debris recruitment would occur; and using fire to reinvigorate decadent riparian species, particularly those being heavily browsed by wildlife species. This would occur while protecting current habitat parameters and are described by activity and unit in the "RHCA Modification" documents located in the Project File.

Alternatives 1, 1M, and 3 propose construction of a boat launch facility in Young Creek bay, reconstruction of the Robinson Mountain trail, and renovation of the Robinson Mountain Lookout for future use as a rental lookout. None of these activities are anticipated to affect fish populations or aquatic habitat within the Analysis Area due to the location, type, and scale of the proposed activities. Only the boat launch facility is near aquatic habitat, and its effect on this habitat or fish populations within the Analysis Area is immeasurably low because it would harden an otherwise erodible section of bank, and the scope of a boat launch within the reservoir is too small to have a measurable effect on aquatic habitat or populations in Koocanusa Reservoir. Other proposed activities such as the trail and lookout projects are not located near aquatic habitat and would have no effect on the fisheries resource due to their scale, limited ground disturbance, and distance to occupied aquatic habitat.

CUMULATIVE EFFECTS TO THREATENED, ENDANGERED, AND SENSITIVE FISH SPECIES

The cumulative effects Analysis Area for Fisheries is described in the Analysis Area section above. The Cumulative Effects Worksheet, located in the Fisheries section of the Project File, contains the detailed analysis of all past, current, and reasonably foreseeable activities listed in Tables 3-1 and 3-2 in Chapter 3. All activities identified to occur within the Analysis Area that have the potential to affect the fisheries resource are discussed below.

Cumulative effects are the result of all the impacts that past, current, and reasonably foreseeable activities have on a resource. The results of past activities are described in the section titled "Summary of Existing Condition" below. The anticipated effects from proposed activities were added to the existing condition and described in the section titled "Summary of Direct and Indirect Effects of the Action Alternatives on the Existing Condition". Then the impacts of current and reasonably foreseeable actions are added to the effects described in the direct and indirect effects section below. The sum of all these effects is the cumulative effects.

All past actions listed in Appendix 5 within the Young and Dodge Creek watersheds in addition to the roads and trails, cattle grazing, private and state land activities within the Analysis Area were considered to be relevant to the cumulative effects of all actions in the Young Dodge Fisheries Analysis Area. Since fish inhabit most of the main stems of Young and Dodge Creeks all activities within these drainages were considered to be relevant and could have some incremental effect on stream conditions and/or fish populations. These activities were accounted for in the water yield modeling for Young and Dodge Creeks. Fish population numbers and habitat data were compared at different peak flow levels (PFI's) to assess cumulative effects (see comparisons in Summary of Cumulative Effects below).

Based on past monitoring of stream flows, aquatic habitat, and fish populations, all laws, regulations, and policies regarding the fishery resource would be protected under the implementation of any of the action alternatives. Below is the rationale for this conclusion.

Summary of the Effects of Past Actions on the Existing Condition

While it is impossible to state whether aquatic habitat conditions have improved or declined from reference conditions, it is plausible to conclude, based on a comparison of habitat data to the PIBO EM data, that habitat conditions are adequate to support viable populations of fish within the Analysis Area. Fish population data shows that there are stable or increasing populations of fish in Young and Dodge

Creeks. Hydrologic data (see Water Resources section) also indicates that physical stream conditions are currently providing suitable habitat and based on their current stability, are expected to continue to provide suitable habitat in the future. Cumulatively, this assessment of existing conditions considers the activities found in Appendix 5 in the FSEIS within the Young and Dodge Creek watersheds, in addition to the roads and trails, cattle grazing, private and state land activities, and all climatic and environmental variables that are outside of human control. Fisheries Table 3-1 shows that habitat conditions have remained stable or improved between the first two survey periods (which are comparable, for reasons discussed earlier). Fish populations during this time have also remained relatively stable indicating that suitable habitat is being provided (Fisheries Figures 3-1 through 3-3 and 3-5).

Summary of Direct and Indirect Effects of the Action Alternatives on the Existing Condition

Alternatives 1, 1M, or 3 would add no measurable effects to Young and Dodge Creeks in the long-term. Stream flow changes, in light of current stream data, should not produce any negative effects to aquatic habitat because they are within historic ranges and at or near levels of peak flow increase that monitoring has shown did not degrade channel conditions. BMP improvements would minimize any potential management-induced increase in sediment from reaching the stream network over the long-term. Changes in RMO attainment have not been tied specifically to any type of management. According to the PIBO EM report (2008), nine of the eleven parameters examined showed favorable trends between the original sample period in 2001 or 2002 and the revisit in 2006 or 2007. Of the nine improved parameters, four had statistically significant improvements. One negatively trending parameter (residual pool depth) had a statistically significant change, but the trend was the same for managed and unmanaged streams, likely due to a lack of scouring flows prior to the revisit surveys. In light of the PIBO EM data and current site-specific habitat, hydrologic, and fish population data, it is unlikely that any action alternative would have a measurable negative impact on aquatic habitat, population numbers, or population viability. Despite not meeting all the RMOs, these streams are still providing stable habitat that has changed very little in the last ten years despite wildfires, timber harvest, prescribed burning, and road maintenance activities, while fish populations have remained stable or improved. A population viability analysis screen of existing and expected post-implementation conditions showed that population viability in the Analysis Area would not be affected by any action alternative (Rieman et al 1993).

Effects of Current and Reasonably Foreseeable Actions

Vegetation Management and Fuels Reduction Activities

All proposed vegetation management listed in Table 3-2 of Chapter 3 was considered in this analysis. No new harvest is scheduled for the Analysis Area, but planned prescribed burning would be conducted. It was determined that these activities would not increase peak flows (refer to Water Resources section). Due to the limited scope, types of activities listed, and the location of the activities, there would be no measurable effects to fisheries from any of the listed non-commercial tree cutting activities. Underburning associated with post-harvest fuel treatment and wildlife improvement does not result in crown removal that would change water yields, and sediment outputs are not measurable, based on past experience with these activities. The Dodge Mountain Pine Beetle thinning is not expected to not have an effect on fisheries in the project area because Poverty Creek does not sustain a fish population. Planting, precommercial thinning, bough and cone collection, and Christmas tree cutting do not have any effect on water yields and no sediment is produced with any of these activities due to their location, limited ground disturbance, and scale of the activities. Harvest activities associated with blowdown salvage do not have an effect on water yield and sediment outputs are negligible due to the fact that yarding occurs from existing roads. If blowdown salvage were to occur, the appropriate analysis would be conducted.

Livestock Grazing

No cumulative effects to fisheries or other beneficial uses are expected from these activities. Cattle grazing occurs throughout most of the Analysis Area, mostly in areas that do not support fish. Cattle are generally kept away from fish-bearing portions of streams by the steep topography, except at road crossings. Data collected in the last five years shows no adverse effects due to cattle grazing (see bank stability values in v03d036 in Project File) and no further adverse effects are anticipated due to the location and type of riparian activities with this project. This is due to the fact that harvest activities do not affect the limiting factor for cattle distribution, which is steep topography.

Noxious Weed Treatment

This activity has no measurable effects on the fisheries resource as defined by the Kootenai National Forest Invasive Plant Management Project (USDA Forest Service 2007). Approved application methods and design criteria would be used. District water quality monitoring (MSU 2008) has shown that no chemical contamination has occurred during control efforts to date. Although new weed infestations may occur due to ground disturbance activities, improvements in treatment chemicals and use of Best Management Practices during timber sale and burning operations should minimize the occurrence and effects of new infestations. Therefore, no cumulative adverse effects are anticipated.

Fire Suppression

The effects of fire suppression, including the construction of fire lines, safety zones, and helispots, are highly variable. However, when all guidelines for suppression efforts near streams are followed, no cumulative adverse effects to the fisheries resource are anticipated. This can be evidenced by examining Fisheries Figure 3-3. This figure shows fish populations were near their low-point in 2001, the year following the Young J fire. Fire suppression was conducted in an international effort to contain this fire. In the years following the fire, fish population estimates continue to rise.

Road Management

Road maintenance would reduce long-term sediment inputs to streams by fixing surface drainage problems, unplugging culverts, replacing undersized culverts, and repairing small slope failures. These activities would improve aquatic habitat conditions over the long-term. However, short-term sediment inputs would occur where culverts are replaced (Wegner 1999). These inputs would likely remain near the site for up to two years (Hickenbottom 2001), and would not likely be in the immediate area of sensitive fish habitat. In cases where fish are nearby, the only effect on fish is generally short-term avoidance of the work site. Administrative road use would not result in sediment inputs to streams. Because of the overall improvements made during road maintenance work, there would be no adverse cumulative effects to the fisheries resource.

Recreation Management

Routine trail maintenance would have an immeasurably low effect on aquatic habitat. Minor drainage repairs could contribute minor amounts of sediment to streams, but would be far enough away from listed fish habitat to be immeasurable. These improvements could also reduce chronic sediment inputs and improve habitat conditions over time. There would be no adverse cumulative effects to the fisheries resource associated with these activities.

Special Uses

Outfitters/guides would have no effect on listed aquatic habitat. Use of NFS lands would include walking or horseback riding on trails and closed roads. No ground-disturbing activities would occur under the issuance of these permits. Other special uses for water withdrawals, etc. have been ongoing for years with no measurable effects to habitat or fish numbers based on past monitoring.

Public Use

Recreational use of NFS lands would have no measurable direct or indirect effects to the fisheries resource. The small scale of these activities and their wide disbursement over the landscape generally precludes effects to the fisheries resource. Therefore, no adverse cumulative effects are anticipated.

Private Property

The activities on private property occur mainly in the lower elevation areas of the Analysis Area. It was assumed that 7 homes would be constructed in the Analysis Area annually. These areas are mostly away from streams. As long as existing laws and regulations are followed, impacts to fisheries are anticipated to be negligible. Therefore, no adverse cumulative effects are anticipated.

State Land

Some amount of thinning is proposed on approximately 50 acres within the Young Creek Wildlife Management Area, west of Green's Basin. This activity should have no effect on fisheries, as this area does not drain into a fish-bearing stream.

SUMMARY OF CUMULATIVE EFFECTS

Short-term sediment increases from road management activities would not likely cause impacts that would affect fish populations negatively in the short- or long-term because: 1) fish can move downstream to where work-related sediments are more diluted; 2) fish can tolerate short-term sediment increases without having lethal effects on them; 3) all applicable BMPs would be implemented during these activities; and 4) the long-term benefits of reducing road failure risk and chronic sediment inputs outweighs any short-term effects of road management activities on fish at the population scale.

Fire suppression effects are not site-specific enough to determine precise effects. However, in general, fire suppression personnel attempt to mitigate their effects to aquatic resources through the use of Minimum Impact Suppression Tactics, screens on pump foot valves, hazardous material containment equipment at pump sites, placement of fire suppression infrastructure outside of riparian areas, and the use of strategies and tactics that minimize ground disturbance (where safe and practical).

Similar amounts of land use activities, to that proposed, have occurred at some point during the monitoring period within the Young Dodge Analysis Area. Modeled Peak Flow Increases (PFI; see Water Table 3-4 and 3-5 for more information) during this period have decreased as vegetation recovery occured in the area. Fish abundance has fluctuated during this period (Fisheries Tables 3-1 to 3-5), with current estimates in some reaches lower than previous years when PFI's were higher. This suggests PFI's are likely not influencing fish abundance. Fish populations are affected by a variety of biological, physical, and social variables, not solely PFI's. Thus, any effects of PFI's established in previous EA's (e.g., West Kootenai, Marias, Young J) on fish populations within the Analysis Area are negligible. Environmental factors, interactions between non-native brook trout and native westslope cutthroat trout, and angling pressure in Young and Dodge Creeks are more important drivers of population dynamics in these systems. In short, any PFI at or below 13% (identified in the Water Section, Chapter 3) is not expected to measurably affect fish populations in Young and Dodge creeks.

Aquatic habitat conditions have been relatively similar in Young and Dodge Creeks (Fisheries Table 3-2), despite declining PFI thresholds from 1994 to present (Water Table 3-4). The lack of a consistent relationship between PFI's and habitat condition suggest other variables are influencing trends in habitat condition. The range of historic PFI's in Young and Dodge creeks appears to be low enough as not to produce measurable effects on aquatic habitat conditions. Parallel with fish populations, any PFI at or below 13% (identified in the Water Section, Chapter 3) is not expected to measurably affect aquatic habitat conditions in Young and Dodge creeks.

In summary, it is possible that fire suppression could reduce short-term aquatic habitat and have effects to individual fish during a fire. However, these effects may or may not occur during the time-frame of this project due to the unpredictable nature of wildfire. Road management activities would also have short-term effects to aquatic habitat and individual fish at a site-specific level, typically at a very small scale (approximately 200 hundred feet). These effects, in addition to those from past and current activities, are not expected to have a measurable effect on fish populations. Some activities, as noted, may have minor and short-term effects at small spatial and individual scales. These effects would not transfer to population level effects, nor would they affect aquatic habitat at the reach scale. Therefore, population viability and stream level habitat productivity are expected to be maintained under any of the alternatives described in this document.

STATEMENT OF EFFECTS

Alternatives 1, 1M, and 3 <u>may impact individuals, but would not contribute to a trend toward federal listing or a loss of population viability</u> for westslope cutthroat trout. This determination is based on: 1) these alternatives having immeasurably low impacts to aquatic systems within the Analysis Area; 2) utilization of modified RHCAs that would protect riparian systems, filter sediment from management activities before it would reach live water, and maintain habitat characteristics needed by westslope cutthroat trout; and 3) road maintenance, intermittent stored service, and decommissioning should decrease risk of road-related sediment delivery to streams within the Analysis Area; 4) population estimates showing adequate numbers of cutthroat trout in the population to measure effects against.

Alternative 2 would have <u>no impact</u> on westslope cutthroat trout. This determination is based on: 1) no timber harvest occurring under this alternative; and 2) other routine management activities (road maintenance, planting, thinning, etc.) are low impact and improve watershed conditions.

CONSISTENCY WITH REGULATORY FRAMEWORK

COMPLIANCE WITH FOREST PLAN, NATIONAL FOREST MANAGEMENT ACT, AND ENDANGERED SPECIES ACT REQUIREMENTS FOR THREATENED, ENDANGERED, AND SENSITIVE FISH SPECIES.

Forest Plan

Fish habitat surveys were conducted in 1998, 2004, and 2006 in Young Creek and 2000, 2004, and 2006 in Dodge Creek. Results of these surveys are shown in Fisheries Tables 3-1 through 3-3. RMO compliance has generally remained the same over time. RMO attainment is not expected to decline due to actions from any action alternative for the following reasons: 1) use of default and modified RHCAs that would protect riparian vegetation and provide a buffer to lessen potential management effects on streams; 2) multi-region data analysis shows that where INFS is being implemented, stream conditions are improving in both managed and unmanaged streams; and 3) management would not change peak flows above a point where they would negatively affect stream channels. Alternatives 1, 1M, 2, and 3 would not retard the attainment of RMOs within the Analysis Area. RHCA modification rationale is listed in the Project File for each type of activity.

All Alternatives would be consistent with the Forest Plan goal to “Maintain or enhance fisheries habitat” (USDA Forest Service 1987a II-2). There would be no adverse actions within RHCAs and attainment of

RMOs would not be retarded, and peak flow increases would remain at or below recommended levels in all watersheds as a result of any proposed activities.

Compliance with the Recreational Fisheries Executive Order and Stewardship Initiative (Executive Order 12962 1995).

The affected watersheds provide a limited amount of recreational fishing on NFS lands. Young and Dodge Creeks are used by anglers. None of the proposed alternatives would degrade aquatic habitat measurably. Alternatives that change the current accessibility to fisheries resources can also impact recreational fishing opportunities. Alternatives 1, 1M, and 3 would provide additional access to the reservoir, but not to the streams within the Analysis Area. Activities occurring on the reservoir are outside the scope of this project. There may be some short-term adverse effects to aquatic habitat as a result of proposed road management activities. However, these effects are not expected to affect entire fish populations, and would result in a long-term upward trend in aquatic habitat quality. As long as RHCA guidelines are met for given activities within an alternative, there should be no effect to recreational fishing. Most stream segments in the Analysis Area do not provide a high degree of recreational opportunity for fishing because of their small size and inaccessibility. None of the alternatives further decreases access to fishing areas.

Endangered Species Act – Threatened and Endangered Fish Species

Threatened and endangered species are managed under the authority of the Endangered Species Act and the National Forest Management Act. They are species designated by the U.S. Fish and Wildlife Service (USFWS) because they are in danger of becoming extinct throughout all or part of their range, or are likely to become so in the near future. The USFWS provided a list of threatened and endangered species that are known or expected to occur on the KNF (Wilson 2007). Bull trout are the only listed fish species in the Analysis Area.

Bull trout occupy Koocanusa Reservoir, spawning and rearing in some tributaries to the Reservoir. Bull trout have been found migrating up Young Creek and in electrofishing surveys (MFWP 1998 2002). Only Young Creek was designated as a consultation watershed in 2001 (Wilson 2001). Alternatives 1, 1M, 2, and 3 would have no effect on bull trout for the following reasons: 1) none of the alternatives would exceed recommended Forest Plan peak flow levels; 2) the distance to suitable habitat from any proposed harvest activities; 3) the use of default and modified RHCA buffers would preclude sediment delivery to streams; 4) in the action alternatives, bringing roads up to BMP standards would be a long-term benefit to fish habitat; and 5) the minimal use by bull trout within the Analysis Area, including the lack of use as spawning and rearing habitat. There is no bull trout critical habitat designated in the Project Area. Therefore, Alternatives 1, 1M, 2, and 3 would have no effect on bull trout or designated bull trout critical habitat.

WILDLIFE RESOURCES

INTRODUCTION

The Kootenai National Forest provides habitat for over 300 different species of wildlife (KIPZ Analysis of the Management Situation USDA Forest Service 2003b 49 59-64), many of which occur on the Rexford Ranger District and within the Young Dodge Analysis Area. The presence or absence of these wildlife species depends on the amount, distribution, and quality of each animal's preferred habitat. In addition to habitat changes, many of these animals are impacted by hunting or trapping. Montana Fish, Wildlife & Parks (MFWP) regulates game animal populations. The Forest Service and MFWP work together to ensure that an appropriate balance is maintained between habitat capability and population numbers. The Forest Service also works closely with the U.S. Fish & Wildlife Service (USFWS) to assist in the recovery of animals listed under the Endangered Species Act (ESA). Proposed federal projects that have the potential to impact species protected by the ESA require consultation with the USFWS.

For the purpose of this Final Supplemental Environmental Impact Statement (FSEIS), a number of wildlife species were selected for detailed analysis. The species chosen represent a combination of fine filter (species specific) and coarse filter (management indicator species) analyses. The USFWS requires that endangered, threatened, and proposed species be included in an effects analysis. The Regional Forester designates sensitive species. Any effects to sensitive species present or potentially present in a project area must be disclosed. Management Indicator species (MIS) are identified in the Kootenai Forest Plan (1987 Appendix 12) and represent a particular habitat or habitat complex. Each MIS represents a group of species that share common habitat components required for sustained growth and successful reproduction. Other species that would not be affected by any of the alternatives are reviewed, but not discussed in detail. The wildlife portion of this chapter is divided into six sections: old growth, snags and down woody debris, MIS, sensitive species, threatened and endangered species, and migratory birds.

The bounds of analysis for each species were determined using the viability analysis concepts described by Ruggiero et al (1994). Species diversity analysis incorporates and builds on information found in the forest-wide conservation plan (Johnson 2004).

The wildlife analyses include the baseline conditions (created by all past management practices and natural events, Appendix 5); direct, indirect and cumulative effects of the proposed actions; and cumulative effects of reasonably foreseeable projects (Chapter I-13 to 15). The analyses are based on a review of Forest and District records, a thorough review of the best relevant scientific information, a consideration of responsible opposing views, an acknowledgment of incomplete or unavailable information and recognition of relevant scientific uncertainty.

OLD GROWTH

Data Sources, Methods, Assumptions, Bounds of Analysis

Management and characteristics of old growth and stand attributes necessary for a stand to be considered old growth are discussed and summarized in the KNF Forest Plan (Appendix 17 FP II-1 7 22 FP III-54); Green et al (1992); Pfister et al (2000); Kootenai Supplement No. 85 to FSM 2432.22 (1991); Castenada (2004). That information is incorporated by reference. Data sources to identify old growth stands include District files and surveys, the KNF old growth GIS layer developed from stand-level old growth inventory that is aggregated and summarized at the Forest scale, and the Forest Inventory and Analysis (FIA) data that collects and reports data at the Forest scale. For the timber compartments 1, 2, 3, 4, and 5 found, in whole or in part, within the Young Dodge PSU, field verification of old growth stands was completed using stand exams with snag plots.

The KNF Plan identified the pileated woodpecker as the management indicator species for old growth habitat (KNF FP-Vol II Appendix 12-1). For effects to old growth associated wildlife species, refer to the pileated woodpecker analysis in the Management Indicator Species (MIS) section of this document.

Criteria used, when applicable, to compare the alternative impacts on old growth include:

1) Acres of vertical structure removed. These are the acres of direct harvest in designated old growth. This includes both effective (OG) and replacement (ROG) old growth.

2) Acres of harvest in undesignated effective old growth (OG).

3) Road length built adjacent or through designated old growth (in feet).

4) Number of proposed units adjacent to old growth

5) Acres of edge effect in old growth

6) Acres of interior habitat remaining in old growth

7) Acres of additional old growth designated.

8) Acres treated to maintain old growth characteristics or trend toward old growth

9) Percent of designated old growth (OG/ROG) in the PSU.

Current edge effects were determined by buffering existing regeneration harvest units (TSMRS activity codes 4100-4134) that are ≤ 30 years old and bordering old growth stands by 300 feet (three tree heights- Russell et al 2000 134; Harris 1984 110-111; Morrison et al 1992 84; Province of BC 1995 App 1; Ripple et al 1991 79). On the Kootenai, the average old growth tree height across old growth types is 100 feet (KNF TSMRS). Effects of alternatives were determined by using the same buffer on proposed regeneration units that border old growth stands.

The analysis boundary for project impacts and cumulative effects to old growth is the Young Dodge PSU, based on Castaneda (2004), while viability of the old growth resource and its MIS species are analyzed at the Forest level.

Affected Environment/Existing Condition

Existing conditions are a result of historic timber harvest and wildfires (MAP 1-2). The effects of past timber harvest and fire history are discussed in the Vegetation section of this document. Old growth surveys within the Young Dodge PSU have inventoried approximately 4943 acres (both above and below 5500 feet elevation). Of those acres initially thought to be old growth, 891 acres were distributed above 5500 feet in elevation. This leaves approximately 4052 acres of inventoried old growth (OG) or replacement old growth (ROG) in the Young Dodge PSU. Of these acres, approximately 1167 acres are considered either designated or undesignated replacement old growth (ROG). See MAP 3-9, for location of old growth stands within the PSU. Old Growth Table 3-1 summarizes the designated and undesignated status of the OG and ROG acres in the Young Dodge PSU and the Kootenai Forest-wide situation.

Replacement old growth stands have many old growth characteristics, but not enough to be considered old growth currently. These stands are expected to become old growth in time.

Old Growth Table 3-1 also shows the minimum acres required to be designated to meet Forest Plan standards. Designated old growth stands in the PSU support the habitat conditions described in "*Old Growth Forest Types of the Northern Region*" (Green et al 1992).

The Young Dodge PSU contains 33,373 acres below 5500 feet (28,080 acres NFS lands and 3722 acres private land; 1571 State of Montana land). Old growth stands on State lands have been harvested, and the 4052 acres of old growth remaining on NFS lands ≤5500 feet is approximately 14.4 % of all NFS lands ≤5500 feet in the Young Dodge PSU. The present allocations (see Old Growth Table 3-1) in the Young Dodge PSU meet Forest Plan direction as clarified in FSM 2432.22.

Old growth stands in the PSU are mainly composed of old larch, ponderosa pine, Douglas-fir, and other conifers. Old growth Management Area (MA) designations in the PSU were made to conserve the best old growth attributes available and to provide the best distribution, size, habitat type coverage, and quality of what is available. These old growth stands are physically connected to other old growth stands where possible, or are interconnected to adjacent old growth stands by stands composed of 100+ year old age classes.

Old Growth Table 3- 1 Old Growth Acres ≤5500 Feet Elevation for NFS Lands in the Young Dodge Planning Subunit and Forest-wide

STATUS	***Planning Subunit Acres (Percent)**	**Kootenai National Forest Acres (Percent)**
Total NFS lands	32,590 (86.0)	
Total NFS lands below 5500 feet elevation	28,080 (74.1)	1,869,200
Minimum acre designation required by Forest Plan	2808	186,920 (10)
DESIGNATED OG (MA13, or OG MA)		
Designated effective OG	2330 (8.3)	138,902 (7.4)
Designated ROG	575 (2.0)	62,605 (3.3)
Designated unknown (KNF Forest Plan)	0 (0)	19,824 (1.1)
Total designated OG and ROG	2905 (10.3)	221,065 (11.8)
UNDESIGNATED EFFECTIVE OG AND ROG		
Undesignated effective OG	555 (2.0)	61,192 (3.3)
Undesignated ROG	592 (2.1)	36,229 (1.9)
TOTALS FOR BOTH DESIGNATED AND UNDESIGNATED OG AND ROG		
Total designated and undesignated effective OG	2885 (10.3)	200,094 (10.7)
Total designated and undesignated ROG	1167 (4.2)	98,834 (5.3)
All old growth acres below 5500 feet	4052 (14.4)	298,699 (16.0)

*Acres were updated in 2007 for the Young Dodge PSU. Forest-wide acres as of October, 2004.

*Replacement old growth stands were designated to provide old growth in the future within the PSU.

Block Size

There are a total of 2905 acres designated for old growth management. These acres are in nine blocks ranging from 85 to 1154 acres in size. All designated old growth blocks are greater than 50 acres in size.

When undesignated OG and ROG stands are considered in conjunction with designated stands, there are a total of 4943 acres (above and below 5500 feet) in block sizes ranging from 45 to 2372 acres. Of these 13 blocks, twelve (92%) are greater than 50 acres in size. The larger blocks provide interior habitat and connectivity within the areas of National Forest lands.

Stands smaller than 50 acres in size were designated to protect additional attributes unique to old growth where they exist in the PSU. They were designated based on recommendations in Morrison et al (1992 85), where they state *"it is vital to recognize that in heavily fragmented landscapes, the last remaining patches of older or forested vegetation may play an important role. The patches may act as stepping stones for dispersal of many species associated with the specific environmental conditions throughout the landscape. Removal of such patches because they fail to meet criteria for size and provision of interior conditions may result in a network of dispersal for wildlife being severed in the landscape"*. These stands are largely surrounded by multi-aged stands that provide corridor links to larger blocks of old growth.

Distribution

Old Growth Table 3-2 shows the distribution of old growth (< 5500' elevation) by VRU. Old growth is well distributed across the vegetation types.

Old Growth Table 3- 2 Old Growth (<5500' elevation) Distribution by VRU on NFS Lands in the Young Dodge PSU

VRU	HRV % OG \1	VRU Acres (%) NFS Lands	Designated OG Acres (%)	Undesignated Old Growth Acres (%)	TOTAL OG (undesignated and designated) Acres (%)
2	20-50	11,844 (36.3)	1238 (10.5)	831 (7.0)	2069 (17.5)
3	15-40	2563 (7.9)	398 (15.5)	60 (2.3)	458 (17.8)
5	25-55	2252 (6.9)	747 (33.2)	53 (2.4)	800 (35.6)
7	15-45	10,980 (33.7)	534 (4.9)	27 (.25)	561 (5.1)
9	5-10	4170 (12.8)	30 (.72)	176 (4.2)	206 (5.0)

\1 USDA Forest Service 1999: stands > 150 years old

These designated old growth stands represent the best distribution of old growth habitat that remains in the PSU (following Forest Plan direction), recognizing that these areas and their boundaries may change due to natural events such as windstorms, epidemic insect infestations, and stand replacement fires.

Stand Structure

Old growth stand structure is described by Green et al (1992 errata corrected 2005). That information is incorporated by reference. In summary, Green identifies three structural stages that are useful in describing old growth. They are late seral single story (e.g. ponderosa pine, Douglas-Fir, lodgepole pine sites); late seral multi-story (e.g. larch, western whitepine) and near climax (e.g. cedar, grand fir, sub-alpine fir sites). Stands identified as old growth contain one of these structure stages described by Green.

Disturbance

Within existing designated old growth there are approximately 14 miles of local roads. Of these, 0.6 miles are restricted seasonally, 7.5 miles are restricted yearlong, 5.9 miles are open yearlong; and there are no miles of motorized trail. These roads either bisect or are adjacent to old growth stands. Roads allow for potential access by firewood cutters to remove standing snags. There are 49 old growth stands adjacent to 48 existing regeneration units (stands < 30 years old). These units create an edge influence on about 725 acres of old growth.

Environmental Consequences / Effects

Management activities (including timber harvest, road construction, mining, etc.) have the potential to impact the function of old growth habitat or specific components of old growth, such as interior habitat and vertical structure. Activities may also allow noxious weed invasion.

Timber harvesting can affect adjacent old growth stands by altering six microclimatic factors (solar radiation, soil temperature and moisture, air temperature, relative humidity and wind speed (Chen et al 1995). Microclimatic changes lead to vegetative changes (e.g. species richness, diversity, structure, composition) (Russell and Jones 2001). Changes in vegetative conditions may lead to effects such as changes in wildlife species using the area, species abundance, and higher predation (Askins 2000 120) (see pileated woodpecker analysis). All these effects extend varying distances into the uncut stands depending on a number of variables (e.g. aspect, slope, elevation, wind speed and direction, etc.). While there is no single answer to how wide the area influenced by edge is (Chen et al 1995), research (Harris 1984; Russell et al 2000; Morrison et al 1992; Ripple et al 1991; Province of BC 1995) has identified a three-tree height rule of thumb as the distance effects occur. Old Growth Table 3-4 (below) displays the acres of old growth influenced by edge effects. The depth of influence is also related to time since harvest, with effects dissipating within 20 to 50 years, depending on the factor (Russell and Jones 2001; Ripple et al 1991; Russell et al 2000). In the Young Dodge PSU, average tree growth in regeneration units result in tree heights (20-50 feet) and densities (fully stocked stands) that reduce the depth of influence from edge effects after 30 years.

While changes in vegetation and wildlife use may occur on the acres influenced by edge, those acres remain functional old growth for some species. The old growth acres not impacted by edge effects provide interior habitat.

Direct and Indirect Effects

Old Growth Table 3- 3 Direct and Indirect Effects to Old Growth

Measurement Criteria	Alt.1	Alt 1M	Alt 3
Acres of vertical structure removed in designated OG/ROG	152	152	0
Road length (in feet) built adjacent/through designated OG/ROG	0	0	0
Acres of vertical structure removed in undesignated OG	221	221	0
Number of proposed units adjacent to old growth	9	7	9
Acres of additional old growth designated	0	0	0
Acres treated to maintain OG or trend stand toward OG	373	373	0
Additional Acres of edge influence in old growth	241	217	181
Acres of interior habitat remaining in old growth following proposed treatment	1939	1963	1999
Percent change of designated old growth in Sub-Unit (OG+ROG)	0	0	0

Alternative 2 - No Action

This alternative would have no direct effect on designated old growth or associated plant and wildlife species (also see pileated woodpecker discussion). The conditions for all nine measurement criteria (see Old Growth Table 3-3) would remain unchanged. No old growth would be treated through timber harvest or prescribed burning. There would be no risks from these activities, such as soil compaction, weed introduction, or modification of stand structure. All old growth areas would maintain their existing conditions, and continue to provide habitat for those species that utilize the area over the long-term. This analysis accounted for the possibility for snag removal in old growth, as well as other mature forest stands on all Forest System roads, both open and restricted. Restricted roads are opened occasionally for personal firewood gathering (See Snag Table 3-2 in the Snag/Down Woody Debris section – also applicable to Alternatives 1, 1M, and 3).

Effects of Alternatives 1, 1M and 3

Alternative 3 is similar to Alternative 2 in that no treatments of any kind are proposed in any category of old growth. Any changes to the composition and structure of old growth under Alternative 3 would be the result of natural processes such as insects, disease, or windstorms and wildfire.

While Alternatives 1 and 1M would not result in a reduction of old growth in any category, treatments are proposed in designated effective old growth (MA 13). All treatments are designed to maintain current old growth attributes. Management activities (removal of ladder fuels, prescribed fire) are proposed in 152 acres of effective dry-site old growth. The purpose of these activities is to lessen the threat of stand removal by a wildfire and to maintain the integrity of the stand by lessening competition favoring large diameter trees. The outcome would be the maintenance of all old growth structure, function, and health in the treated areas.

Treatments are also proposed in designated replacement old growth under Alternatives 1 and 1M. Activities are designed to improve or preserve attributes that could develop additional old growth characteristics in the near future, as well as maintain the existing old growth attributes in the treatment areas. Alternatives 1 and 1M propose 462 acres of ladder fuel reduction and prescribed fire in designated replacement old growth. Presently, these stands lack enough large trees to be designated as effective old growth. Treatments would increase growth and vigor in the younger age-classes, which would enhance growth into the larger tree diameters.

Undesignated effective old growth would be managed by proposed activities from Alternatives 1 and 1M. Approximately 221 acres of undesignated old growth would be treated to physically remove (slashing) ladder fuels followed by prescribed burning in order to reduce fuel loadings and lessen the possibility of stand replacement fires on the boundary of private and state lands. This strategy would also assist in prolonging the overall health of these stands and retaining the large-diameter tree component for a longer period of time.

All action alternatives propose treatments adjacent to designated and/or undesignated old growth (a portion of the proposed unit is adjacent to one or more edges of the old growth stand). The effect on existing old growth and the resulting interior acres of old growth from the nine proposed treatment areas can be found in Old Growth Table 3-4, below. In general, seed tree harvest adjacent to just one edge of the old growth stands would subject the edge to drying and establishment of early successional plant species (Morrison et al 1992).

No new roads or temporary roads would be constructed through old growth stands in any action alternative. Likewise, none of the action alternatives propose construction that would result in permanent roads. Access to proposed treatment units is already in place for all action alternatives and only skid trails within the proposed units would be necessary to implement vegetation treatments. During project implementation, access to treatment areas would be restricted to the general public, so no additional effects to old growth are anticipated other than those previously disclosed in the Alternative 2 discussion and within the discussion of Snag Resources.

No prescribed fire is proposed in any designated or undesignated old growth stands under Alternative 3. However, prescribed fire (in addition to those previously disclosed above; 152 ac slash/burn in designated effective, 462 ac slash/burn in designated replacement) is proposed as part of Alternatives 1 and 1M and is distributed across all four old growth categories (designated effective and replacement; undesignated effective and replacement) totaling 224 acres. Expected effects include a temporary reduction in vertical structure including shrubs, reduction in down woody debris, snag loss and snag creation, and slight alteration of microclimate (e.g. soil moisture, penetration of sunlight, change in herbaceous layer, etc.)

The proposed improvement (relocation) of the Robinson Mountain trail to the old South Fork Young Creek Trail #238 may impact some trees or snags contributing to an MA13 block, but since the old trail prism would be utilized, this impact would be minimal. The potential for tree or snag loss at the trailhead along the open road #7205 has already been accounted for in the effects of road systems on snag capability in that any areas 100 feet from any road are considered to have a zero capability to produce snags. The parking location is not adjacent to any mapped old growth.

The parking area (approximately one acre), restroom, and road relocation (0.4 miles) associated with the proposed boat ramp would have no impact on old growth because there is no old growth designated (mapped) for that particular area. Likewise, there is no old growth area near the Robinson Lookout therefore there would be no impact on old growth due to its renovation.

There would be no impacts on the old growth resource from the renewal of existing special uses and outfitter and guide permits in the Young Dodge PSU because the disturbance from these actions has already been accounted for in the existing condition or they are outside of any old growth area.

Ground disturbing activities in or adjacent to old growth may result in noxious weed invasion. The project design includes measures to reduce this potential risk (e.g. washing equipment, weed spraying).

Cumulative Effects

Summary of the Existing Condition

Existing old growth conditions have been cumulatively created by past management actions including fire suppression, forest user activities, as well as natural events, such as fire, windstorms, and insect infestations. Increased edge from adjacent regeneration units and wildfires is one quantifiable example. Other cumulative impacts to old growth resources include a decrease in interior (secure) habitat, loss of vertical and horizontal structure in some stands while other stands have over-accumulated structure due to years of wildfire suppression. All of these effects alter the way wildlife utilize forests classified as old growth. Snags, another important element of old growth, have also been altered in their presence across the landscape. Roads opened for firewood cutting result in some continuing level of snag removal from the old growth stands, while wildfires in old growth create an abundance of snags in localized areas, thus resulting in somewhat of an imbalance of snag distribution.

Summary of Direct / Indirect Effects of Action Alternatives on Existing Condition

Alternatives 1 and 1M propose treatments in various old growth designations. Briefly these include slashing to remove ladder fuels and prescribed burning to reduce fuel loadings. No road building adjacent or through designated old growth is proposed.

Old Growth Table 3- 4 Summary of Cumulative Effects to Old Growth within the Project Area

Measurement Criteria	Existing Condition Alt 2	Alt. 1	Alt. 1M	Alt. 3
Acres of vertical structure removed in designated OG/ROG	n/a	152	152	0
Acres of vertical structure removed in undesignated OG	n/a	221	221	0
Road length (in feet) existing or built adjacent/through designated OG/ROG	73,920	73,920	73,920	73,920
Number of existing or proposed units adjacent to old growth	48	57	55	57
Acres of edge influence in old growth	725	966	942	906
Acres of interior habitat remaining in old growth	2180	1939	1963	1999
Acres of additional old growth designated	0	0	0	0
Acres treated to maintain OG or trend stand toward OG	n/a	373	373	0
Percent of designated old growth in Sub-Unit (OG+ROG)	10.3	10.3	10.3	10.3

Effects of Current and Reasonably Foreseeable Actions

The Cumulative Effects Worksheet, located in the Wildlife section of the Project File, contains the detailed analysis of all past, current, and reasonably foreseeable activities listed in Tables 3-1 and 3-2 (pp III-2-4). All activities identified to occur within the Analysis Area that have the potential to affect the snags are discussed below. Vegetation Management and Fuels Reduction Activities

The Dodge Mountain Pine Beetle thinning unit (93 acres) is planned for 2012 at the southernmost boundary of the Young Dodge PSU. This timber stand improvement project is not within any type of old growth, however it is adjacent to one block of undesignated replacement old growth and one block of undesignated effective old growth. This unit would not result in cumulative edge effects to any old growth due to its prescription.

Cumulatively, the proposed activities (timber harvest, prescribed fire, ground fuel reduction) in designated and undesignated old growth would not reduce the amount and distribution of old growth below Forest Plan requirements. However, due to cumulative edge effects (see Old Growth Table 3-4 above) there may be reduced old growth quality for some plant and animal species, such as resulting in less interior habitat and more edge where predation is more likely to occur or where noxious weed invasions are more likely to become established. However, given the level of impact and the quantity of old growth in the PSU, this effect should be minimal and would diminish in approximately 50 years (Russell and Jones 2001; Ripple et al 1991; Russell et al 2000). Private lands in the Young Dodge PSU were assumed to not provide any old growth, based on past harvest practices.

The action alternatives, in combination with other current and reasonably foreseeable actions including tree planting, precommercial thinning, Christmas tree cutting, boughs, pine cone collecting, and blowdown salvaging (see Table 3-2) would maintain the designated management level of old growth by avoidance. In the instance where existing old growth is burned or blown down, replacement old growth will be designated to account for this loss.

Livestock Grazing

Cattle grazing would not result in a change of old growth habitat, snags or down woody debris in the PSU, as it does not involve the harvest of trees, dead or alive. Grazing cattle predominantly move along road systems and within past harvest units where an abundance of forage can be found.

Noxious Weed Treatment

Noxious weed management would result in no loss or change in snags and down woody debris because weed treatments primarily focus on the herbaceous layer along roads and in previously disturbed areas.

Fire Suppression

In the event of a wildfire, construction of fire lines, helispots, and safety zones could potentially result in impacts to old growth habitat. Conversely, wildfire suppression also serves to preserve existing old growth habitat. Suppression activities are typically subject to input from District Resource Advisors, and protection of special habitats, including old growth, is considered. However, if cumulative effects to old growth habitat result in the habitat no longer functioning as old growth, additional old growth habitat would be designated.

Road Management Activities

Road management actions such as road maintenance and administrative use associated with permit administration, data collection, and monitoring of NFS lands are not likely to affect old growth and other specialized habitats (e.g. snags, down woody debris) because they generally do not result in vegetation removal. The standing tree and snag component would only be affected if considered a hazard to road users. These activities would not result in any change to the quantity of old growth, thus no adverse cumulative effects would be expected.

Recreation Maintenance

Routine maintenance of trails and developed and dispersed recreation sites would not contribute to the cumulative impact on old growth because maintenance of these facilities do not typically involve removal of old growth elements such as large trees or snags unless deemed to be a safety hazard to forest users. In this situation, the removal of a tree or snag is considered negligible.

Special Uses

There are areas previously impacted by special use permits such as gravel pits, building sites (fire station), fish weir, utility corridors, private land access routes, and outfitter/guide trails that will continue to be present and utilized. The ground disturbance on resources such as old growth have been included under the existing condition and would have no additional impacts.

Public Use

Firewood gathering would continue to remove some snags from old growth along open road corridors and these acres were previously accounted for as part of the existing condition. Other forest use activities such as mushroom and berry picking, camping, hunting, Christmas tree cutting, bough collection, etc have little to no measurable impact on old growth because they are largely non-consumptive or rapidly re-established and would not contribute to the cumulative effect on this resource.

Private Property

If private land owners build their estimated 12.5 miles of road and harvest an estimated 25 acres based on 5 homesites, there would likely be a decrease in dry-site old growth within the PSU, but outside of NFS lands.

Other Lands

The state of Montana is proposing to thin 50 acres immediately adjacent to existing old growth blocks in T37N, R28W. This activity should have beneficial effects on neighboring old growth in that the thinning may prevent old growth loss due to any wildfire initiating on these State lands. Being that these lands would only be thinned and not regenerated, there should be little cumulative edge effect to neighboring NFS old growth blocks.

Summary of Cumulative Effects

As previously stated, fire suppression over the last century has altered stands historically maintained by fire disturbance. The affected stands have developed fuel loading and ladder fuels that are uncharacteristic for some sites. These conditions would continue to develop until a natural disturbance occurs.

Potential natural disturbances (wildfire, insect or disease epidemics, wind) could reduce old growth characteristics or completely remove an area of old growth under extreme conditions. Likewise, there is the potential for human caused fires initiating on private lands to move on to adjacent NFS lands and remove old growth that has not been, at least partially, managed either by prescribed burning and/or removal of ladder fuels. In either case, if the large tree component of old growth is removed then replacement old growth would need to be designated.

The most recent Forest-wide old growth analysis concludes that at least 10% of the KNF below 5500 feet elevation is designated for old growth management. The proposed activities would not affect the 10% standard for old growth at either the PSU or Forest scale.

Regulatory Consistency

Forest Plan

All alternatives are consistent with Forest Plan direction to maintain a minimum of 10% old growth below 5500 feet in elevation in each third order drainage or compartment, or a combination of compartments (Kootenai Supplement No 85; supplement to FSM 2432.22).

Based on April 26th, 2004 direction (Castaneda 2004), old growth will be analyzed at the PSU scale. After implementation of the action alternatives, the Young Dodge PSU would have 10.3% designated old growth below 5500 feet elevation. In addition, 1147 acres of undesignated old growth would remain. The most recent Forest-wide assessment as documented in the Forest Plan Monitoring and Evaluation Report (USDA Forest Service 2007) shows that the Kootenai National Forest has 11.6% old growth designated (includes both effective and replacement). The Kootenai Forest Plan established that maintaining 10% of old growth habitat is sufficient to support viable populations of old-growth dependent species (Vol 1 II-1 7; III-54; Vol 2 A17).

MA 13 Recreation Standards: All alternatives comply with these standards. A forest closure order exists to off-highway vehicles that, restricts them to established roads and trails therefore limiting their effect on old growth.

MA 13 Wildlife and Fish Standards: All alternatives comply with these standards, which are largely passive and favor natural processes. Also refer to grizzly bear analysis.

MA 13 Range Standards: All alternatives comply. Due to the lack of available forage in old growth stands, use by grazing cattle is negligible.

MA 13 Timber standards: All alternatives comply with Standards 1 and 3. Unauthorized firewood cutting could impact snags located in old growth habitat, and this effect is taken into consideration in the cavity habitat analysis and accounted for under the existing condition.

MA 13 Facilities standards: All alternatives comply with Standards 2 and 3. All alternatives would continue to restrict motorized access on local roads where closures exist.

MA 13 Fire Standards: Planned ignitions. The proposed slashing and burning is consistent for all alternatives. The Forest Plan (Vol 1 III-56) states that planned ignitions are acceptable to maintain old growth characteristics (e.g. old growth ponderosa pine).

National Forest Management Act

The project complies with the National Forest System Land and Resource Management Planning rule of November 9, 2000, as amended by meeting Kootenai National Forest Land Management Plan direction for old growth and through the utilization of best science for potential impacts on old growth habitat and its MIS species.

SNAGS

Data Sources, Methods, Assumptions, Bounds of Analysis

Thomas (1979: 72-75) was used to determine the percent of the potential population level (PPL) to maintain primary cavity excavator populations (snag level % times % of area with that snag level). The general analysis process was based on the field data and applied as a worst case scenario. Old growth stands provide 100% snag level (SL) as do untreated forest stands (Tincher 1998). Partial cut stands provide at least 60% snag level (Johnson and Lamb 1999). Regeneration units provide 0-80% SL. The percent varies mostly by period of harvest (pre- vs. post Forest plan 1987). Units harvested prior to the Forest Plan and those planned pre-1987 but harvested thru 1992 basically provide no cavity habitat structures (Johnson and Lamb 1999). Post 1987 Forest Plan, (1993-2002) harvest units provide at least 40% SL (USDA Forest Service 2003b). Roads provide 0% SL. Roads account for 4 acres per mile (average 33 feet wide times 5280 feet per mile divided by 43,560 square feet per acre). There is no difference in snag density adjacent to open versus closed roads (Bate and Wisdom 2004).

For this project, old growth stands and stands with multi-story, low or high risk pole timber (MLRD, MHRP), multi-story low and high risk saw timber (MLRS, MHRS), and saw timber (SAWT) were categorized as forested stands that provide 100% snag level. All other stands, whether partially treated or regenerated were given a conservative average snag capability level of 20% whether or not the stands were treated prior to or after the 1987 Forest Plan. Additionally, the forest acres within 100 feet of any road were given a zero percent (0%) snag level in order to adjust for the loss of snags along roads over time. A one hundred foot zone along roads was chosen based on field observations and conversations with firewood cutters, which is adequate given that many firewood cutters do not pull snags uphill nor do they winch trees much farther than 100 feet from a solid road surface.

The Kootenai Forest Plan recommends applying minimum cavity excavator potential population levels (PPL) on a drainage or compartment basis at the following levels: maintain at least 40% of the PPL throughout commercial forest lands, and maintain at least 60% of the PPL in riparian areas (Kootenai FP 1987). These recommended percentages equate to snag levels of approximately 0.9 snags per acre for the 40% PPL, and 1.35 snags per acre for the 60% PPL. Due to the need to provide a continuous supply of snags over time, there is also a need to designate green trees as snag replacements. Usually 2 replacements are needed for every snag needed (USDA Forest Service 1987 A 16-11). This results in the general recommendation of 1-2 snags and 2-4 snag replacements per acre or a total of 3-6 per acre. The

Forest Plan riparian standards, as amended by the Inland Native Fish Strategy (INFS) (USDA Forest Service 1995b), provide adequate snags and replacement trees to meet the riparian 60% SL standard. Therefore, the following analysis focuses on the general forest standard of 40% PPL.

New science (e.g. Bull et al 1997), since the 1987 KNF Forest Plan, has been incorporated into the Northern Region Snag Protocol (USDA Forest Service 2000). This protocol used the Forest Inventory Analysis data for 1988 to 1995 to estimate snag numbers by Vegetative Response Unit (VRU) cluster (see Snag Table 3-1, below). The protocol further recommends Forests use local data to fine tune the protocol and recommended snag management levels. The Interior Columbia Basin Ecosystem Management Plan (DEIS Appendix 12) (USDA et al 2000b) also provides new data on snags. Like the R1 Snag protocol, the ICBEMP document recognizes the need to use local data to fine tune recommended snag management levels. The Kootenai NF has established optional snag management levels based on local data (Johnson 2005). These snag levels are greater than the KNF Forest Plan snag standards. These recommendations were considered in this analysis as part of the design criteria for snag retention in proposed treatment units.

The pileated woodpecker is the Management Indicator Species (MIS) for snags (Forest Plan App 12) (see MIS section). The Forest Plan assumption is that effects of a proposed action on MIS can be correlated to effects on other species with similar habitat requirements. As habitat for MIS species is being maintained, it is assumed that sufficient habitat, such as snags and other snag associated species are also being maintained.

The effect indicators for snag and down wood habitat are: 1) percent of the maximum population potential by PSU; 2) acres treated that reduce snag and down wood levels.

The analysis boundary for project impacts (direct,indirect and cumulative) on snags is the PSU. This size is sufficient to cover home range sizes of species associated with snag and down wood habitat structure. Effects on the viability of MIS pileated woodpecker are evaluated at the Forest scale.

Affected Environment/Existing Condition

Historically, within VRUs 1 and 2, Douglas-fir and ponderosa pine snags and live culls provided a majority of the cavity habitat, with fire resistant ponderosa pine providing most of the large (>19" dbh) snags and live culls. VRU 3 has a higher component of larch snags and culls, which provide an important feature for primary excavators and secondary cavity nesters. The more moist VRUs (5 and 7) also have a component of larch snags in the early and late seral forest condition, with cedar and grand-fir also providing cavity habitat. The number of snags per acre (>10"dbh) likely approached 5-10 snags per acre within all VRUs.

Snags, broken-top live trees, live cull trees, and down logs are used by a great variety of wildlife species for nesting, denning, perching, roosting, feeding, and shelter. On the Kootenai National Forest, forty-two species of birds, fourteen species of mammals, and several species of amphibians are recognized as largely dependent on cavity habitat (snags and down wood). Snag Table 3-2 summarizes the existing cavity habitat potential on National Forest system (NFS) lands in the Young Dodge PSU based on the criteria given above.

The current snag level within the Young Dodge PSU is 45.9 percent (see Snag Table 3-2, below). In other words, 45.9 percent of the area should be able to naturally produce 100 percent of the snags necessary for associated species, and these snags will be distributed across the landscape based on VRUs (as demonstrated by percentage of the PSU in Snag Table 3-1, below). This level exceeds (better than) the Forest Plan standard of 40 percent in general forest habitat, (1987a, II-22; USDA Forest Service, 1987b, A16-3), indicating that existing snag habitat is maintaining viable populations of cavity-dependent species. The current capability rating (see Snag Table 3-1, below) takes into consideration the number of acres altered by man via timber harvest and firewood cutting as described under the written assumptions. The actual procedure and capability matrix, as calculated in Arc GIS, is located in the Wildlife section of the Project File.

Snags Table 3- 1 Snag Capability and Recommendations by VRU

VRU-climatic modifier	Acres / Percent of DA In each VRU	Total Snags/Acre at 100% Capability and Recommended #'s	Recommended # Snags >20" DBH at 100% Capability to retain.
2 - mod. warm & dry	15,637 ac / 41.2%	6	2
3 - mod. warm & mod. dry	2746 ac / 7.2%	8	2
4 - mod. warm & moist	0 ac / 0%	7	2
5 -mod. cool & moist	2497 ac / 6.6 %	9	3
6 - mod. cool & wet	0 ac / 0%	8	4
7 - cool & moist	10,981 ac / 29.1%	12	2
8 - cool & wet	0 ac / 0%	12	1
9 - cool & mod. dry	4171 ac / 11.0%	12	All available
10-cold	758 ac / 2.0%	12	All available

Snags Table 3- 2 Existing Population Potential on NFS lands in the Young Dodge PSU

Habitat Component	Acres	Percent of Sub-unit	Total Snags per Acre \1	Snag Level (%)	Population Potential \2
Old Growth & MLRP, MHRP, MLRS, MHRS, SAWT	11,922	36.6	(2.25)	(100 \3, \4)	36.6
Treated forest areas ranging from clearcuts to thinned stands (avg 20% capability)	15,106	46.4	(<1.0)	(20 \3,	9.3
Roads & Buffer (24.5 acres per mile at 100 foot buffer for 227 miles)	5562	17.0	0 \4	0 \3	0
Total PSU		100	- -	- -	45.9

\1 Value in parenthesis is based on Thomas 1979 Table 18 (pg 72) and include all snags ≥ 10" d.b.h. This number is needed to achieve the Snag Level value in parenthesis in the next column.

\2 Percent of sub-unit (expressed as decimal) times snag level percent = proportionate population potential for each component. Sum of proportionate population potentials from all components equals the PSU potential. (Thomas 1979 72-73)

\3 Managed snag level percent based on averaging areas treated prior to and following 1987 FP.

\4 Based on field observations; conversations with firewood cutters

MLRP = multi-story low risk pole timber; MHRP = multi-story high risk pole; MLRS = multi-story low risk sawtimber; MHRS = multi-story high risk sawtimber; SAWT = sawtimber; POLE = pole timber

Environmental Consequences

In the PSU, all action alternatives would provide at least 40% snag levels following management activities (see Snag Table 3-3). Potential Population Levels would be reduced by 0.6 to 2.6% in the PSU depending on alternative (see Snag Table 3-3).

Snags Table 3- 3 Cumulative Cavity Excavator Potential Population Level (%) by Alternative Based on Forest Plan Standards

	Existing Condition	Alternative 2 (No Action)	Alternative 1	Alternative 1M	Alternative 3
PPL (%) In PSU	45.9	45.3 (-0.6)	43.3 (-2.6)	43.8 (-2.1)	43.5 (-2.4)
Cumulative Acres Treated that Reduce Snag Level	15,106	15,324	16,141**	15,935**	16,036**

(*) Value in parenthesis is percent change (+/-) due to alternative. Change in No Action reflects cumulative effects of other known or reasonably foreseeable actions.

(**) Some treatment acres fall within previously treated stands were not duplicated and already assigned a snag capability level of 0.2 or 20%.

Direct and Indirect Effects

Alternative 2 (No Action)

Under Alternative 2, no activities would be proposed, so no direct effect to snags is expected. Wildlife use of cavity habitat would continue at current levels. The addition or loss of snags would be dependent on other factors, such as firewood cutting, which has already been accounted for 100 feet from all system roads, and wind events, natural attrition, or wildfire. The level of impact from these factors cannot be calculated due to the high uncertainty in predicting occurrence and intensity levels.

Effects Common to All Action Alternatives

Management activities that could reduce snags in riparian areas are restricted by Riparian Habitat Conservation Area (RHCA) standards and guidelines (USDA Forest Service 1995b). For the proposed activities, this would result meeting the riparian standard for snag levels (60%).

Regeneration harvest would result in a long-term (50-100 years) site-specific reduction in suitable cavity habitat for species (e.g. pileated woodpeckers) that do not utilize open areas for nesting. In the long-term, the green trees retained in regeneration units would provide nesting habitat as the new forest develops into a mature stand comprised of snag producing agents.

Underburning and excavator piling are treatments proposed to reduce existing fuels and/or harvest-generated slash. Underburning has the potential to reduce cavity habitat because standing snags can burn up or the bases can burn through, causing them to fall over. Down logs are sometimes partially or wholly consumed by fire. At the same time, underburning also has the potential to create new snags if a green residual tree is killed by fire. The loss or gain of cavity habitat varies widely, and depends on conditions (e.g. weather, fuel loads, and fuel moisture) present when units are underburned. Excavator piling and burning would have less potential for loss or gain of cavity habitat because the burn treatment would be concentrated in pile areas, and piles would generally be located away from snags and leave trees.

Effects of the Action Alternatives 1, 1M, and 3

Direct and Indirect Effects

Implementation of the action alternatives would have direct effects on snag habitat. Snag Table 3-4 summarizes those project activities that would change snag levels. Also see Snag Table 3-3 above for the changes in PPL. Although small, isolated pockets lacking in snags may occur as a result of the action alternatives, overall, management actions would not have a major impact on snags across the landscape and would maintain a viable snag level of 40% or greater as directed by the Forest Plan.

Snags Table 3-4 Acres of Project Activities That Cumulatively Impact Snag Level by Alternative

Activity	Existing Condition	Alternative 2 (\1) (No Action)	Alternative 1	Alternative 1M	Alternative 3
Regeneration Harvest Ac	0	25 Pvt	1912	960	1618
Partial Cutting Ac	0	93 NFS; 50 State	742	1155	863
New Road Construction Ac	0	50 Pvt	0	0	0
Prescribed Fire Ac*	0	0	4005	3850	2796

* Acres treated with prescribed fire may increase and/or decrease snag levels and were not accounted for in capability calculations.

\1 the acres in Alternative 2 are the cumulative effects from other reasonably foreseeable projects on private lands and Dodge MPB Thin Unit 1. They can be added to the acres in the action alternatives to see cumulative effect acres.

Regeneration harvest in Alternatives 1, 1M, and 3 would reduce snag availability specific to the unit areas, and use would change from those species requiring snags with nearby live tree cover (e.g. pileated woodpeckers) to those that will use snags in open sites (e.g. bluebirds, northern flickers, flycatchers). Regeneration harvest can potentially impact long-term cavity habitat, since fewer trees are left on site to be recruited as snags or snag replacements.

Commercial thinning in Alternatives 1, 1M, and 3 would retain higher levels of existing snags than regeneration units, and green replacement trees would be more readily available for future habitat.

No timber harvest is proposed in MA 10, therefore, the snag capability level within this MA designation would remain unchanged, therefore meeting FP standards.

In the long term, the proposed improvement harvests identified in the action alternatives are expected to provide for the continuity of large-diameter ponderosa pine and Douglas-fir. This in turn provides a long-term benefit to cavity-dependent species, as over time they would become snags. Commercial thinning would follow a basal area reduction prescription. A majority of the ponderosa pine - Douglas-fir stands would retain larger and older trees in the over-story to maintain vertical structure and provide future replacement snags. The prescription would result in the removal of small diameter (less than 7" dbh) snags and whips in the understory, which would likely be removed or toppled during logging operations.

On units planned for skyline yarding snags are expected to be lost due to OSHA safety standards. This may also occur on tractor yarding units, depending on snag condition, location and size in relation to skid trails, and falling personnel. These losses have been accounted for in the conservative estimate (20% average amongst units harvested prior to and after 1987 FP) of the snag capability of treated stands (see Snag Tables 3-2 and 3-3, above). Adequate live trees of larger sizes would be available to provide habitat features needed by snag dependent wildlife in the future.

The subsequent prescribed underburning would reduce the small-diameter Douglas-fir encroachment, and any trees that may be killed during the burning would result in the creation of snags. Additionally, fire may facilitate decay in surviving trees by providing an entry point for fungi, which increases the likelihood that the trees would be used by cavity excavators (Smith et al 2000).

Site preparation burning, and prescribed fire on non-harvest units may result in some fire-killed trees and subsequent new snag feeding/nesting sites. Within proposed harvest units, retention of snags greater than 10" dbh would contribute to meeting FP standards for this resource.

There is no area proposed for pre-commercial thinning under this project; however there are areas proposed for roadside salvaging, as well as post and pole opportunities. The potential for snag loss as a result of these activities was accounted for in the effects of road systems on snag capability in that any areas 100 feet from any road are considered to have a zero capability to produce snags.

The proposed improvement (relocation) of the Robinson Mountain trail to the old South Fork Young Creek Trail #238 may impact some trees or snags, but since the old trail prism would be utilized, this impact is considered negligible. The potential for tree or snag loss at the trailhead along the open road #7205 has already been accounted for in the effects of road systems on snag capability in that any areas 100 feet from any road are considered to have a zero capability to produce snags.

Likewise, the parking area (approximately one acre) and road relocation (0.4 miles) associated with the proposed boat ramp may result in a minimal loss of trees and snags to accommodate safe operation of vehicles. Due to the anticipated level of snag loss, impacts to the snag capability of the PSU and associated species are considered negligible. Renovation of the Robinson Lookout would not involve removal of any snags, nor the need to, therefore this activity would not impact the snag resource.

There would be no measurable impacts on the snag resource from the renewal of existing special uses and outfitter and guide permits in the Young Dodge PSU because the disturbance from these actions has already been accounted for in the existing condition. There could be single snag removal in any situations where permitted facilities or personnel may be damaged or threatened by a standing (leaning) dead tree.

Cumulative Effects

Summary of the Existing Condition

In conjunction with naturally occurring events such as insect infestations, windstorms, and wildfires, fire suppression and certain logging practices have negatively changed the amount and distribution of these components across the landscape (USDA Forest Service 2000). Likewise, firewood cutting, a commonplace impact and one that is difficult to measure, has contributed cumulatively to the existing condition of the current snag resource by removing this component, especially within 100 feet of existing road systems. All of these influences on the snag resource can be expected to continue to varying degrees in years to come and will contribute both positively and negatively to the resource in that snags are both created and removed. Snag Table 3-3 displays estimated snag levels for the existing condition based on what is known about past occurrences.

Effects of Current and Reasonably Foreseeable Actions

The Cumulative Effects Worksheet, located in the Wildlife section of the Project File, contains the detailed analysis of all past, current, and reasonably foreseeable activities listed in Tables 3-1 and 3-2 (pp III-2 through III-4) in. All activities identified to occur within the Analysis Area that have the potential to affect the snags are discussed below.

Vegetation Management and Fuels Reduction Activities

The Dodge Mountain Pine Beetle thinning unit (93 acres) is planned for 2012 at the southernmost boundary of the Young Dodge PSU. This timber stand improvement project may result in the loss of individual snags due to thinning activities or due to OSHA guidelines and were reflected under the No Action Alternative 2 effects on snags in Snag Table 3-3, above.

The action alternatives, in combination with other current and reasonably foreseeable vegetation related actions including tree planting, precommercial thinning, Christmas tree cutting, wreath bough collection, character wood collection (log furniture), and blowdown salvaging (see Table 3-2) would maintain the existing level of snags by avoidance with the exception of small snags possibly lost to character wood (furniture) gatherers. Most snags removed for furniture however are small diameter trees (<10" DBH) unsuitable for most cavity nesters and this impact is considered negligible.

Livestock Grazing

Cattle grazing would not result in a change of old growth habitat, snags or down woody debris in the PSU, as it does not involve the harvest of trees, dead or alive.

Noxious Weed Treatment

Noxious weed management would result in no loss or change in snags and down woody debris because weed treatments primarily focus on the herbaceous layer along roads and in previously disturbed areas.

Fire Suppression

Fire suppression activities including the construction of fire lines, helispots, and safety zones could potentially result in impacts to specialized habitats (e.g. old growth, snags and down woody debris). The amount and timing of such a loss cannot be predicted; however, the number of snags created by a wildfire would far exceed those lost during fire suppression efforts. Suppression activities are typically subject to input from District Resource Advisors, and protection of specialized habitats, including snags, is considered.

Road Management Activities

Road management actions such as road maintenance and administrative use associated with permit administration, data collection, and monitoring of NFS lands are not likely to affect specialized habitats (e.g. old growth habitat, snags, down woody debris) because they generally do not result in vegetation removal. The standing tree and snag component would only be affected if considered a hazard to road users. These activities would not result in any change to the snag component, thus no adverse cumulative effects would be expected.

Recreation Maintenance

Routine maintenance of trails and developed and dispersed recreation sites could involve the harvest of snags or green replacement trees that pose a hazard to forest users. However, the scale of the impact would be small and not measurable as a cumulative effect to snag levels or associated species.

Special Uses

There are areas previously impacted by special use permits such as gravel pits, building sites (fire station), fish weir, utility corridors, private land access routes, and outfitter/guide trails that will continue to be present and utilized. The ground disturbance on resources such as snags has been included under the existing condition and would have no additional impacts.

Public Use

Firewood gathering would continue to remove some snags from the open road corridors and these acres were previously accounted for as part of the existing condition. Other public uses such as wildlife viewing, berry picking, camping, snowmobiling etc. have negligible impacts on the snag resource. Most campers utilize down wood for campfires in lieu of felling additional dead wood so this impact would also be negligible.

Private Property

If private land owners build their estimated 12.5 miles of road and harvest an estimated 25 acres, there would likely be a decrease in the overall PPL within the PSU, but outside of NFS lands. These acres are reflected in under the No Action Alternative 2.

Other Lands

The state of Montana is proposing to thin 50 acres immediately adjacent to NFS lands in T37N, R28W. This activity could incidentally result in the removal of existing snags or when they pose a threat to forest workers according to OSHA. Being that these lands would only be thinned and not regenerated, there should be little cumulative impact to the snag resource, however these acres were accounted for in Snag Tables 3-3 and 3-4.

Summary of Cumulative Effects

Cumulatively, with all lands considered, and all other reasonably foreseeable actions on private and state lands considered, sufficient cavity habitat would remain in the Young Dodge PSU.

When other activities including the harvest on private, state, and federal lands discussed under Alternative 2, and all past, present, and reasonably foreseeable activities are considered, habitat on federal lands is considered sufficient to provide cavity habitat to cavity-dependent species. After implementation of Alternative 2 and the reasonably foreseeable Forest Service projects, the primary cavity excavator potential population level on NFS lands is estimated to remain at approximately 45.3% After implementation of Alternatives 1, 1M, or 3 and the reasonably foreseeable projects, the primary cavity excavator potential population level on NFS lands would decrease from 45.9% to 43.3, 43.8, or 43.5% respectively. This level of snag habitat is still expected to provide for an associated species population level above 40 percent, which is thought to be the minimum needed to maintain self-sustaining populations of snag-dependent wildlife (Thomas 1979 72).

The 2002 Forest Plan monitoring report (USDA Forest Service 2003) documents results for the past 16 years, and indicates the Kootenai National Forest is providing sufficient cavity habitat at the drainage or compartment, as well as the Forest scale.

Regulatory Consistency

Forest Plan

All proposed units in **A**lternatives 1, 1M, 2, and 3 maintain at least 40% snag level. No alternative causes the Young Dodge PSU overall PPL to drop below the general forest 40% or riparian 60% primary cavity excavator potential population level. This is consistent with Forest Plan standards.

Kootenai Forest Plan cavity habitat standard (40% PPL) in MAs 15 and 16 is met.

Kootenai Forest Plan cavity habitat standard in MA 10 is met. Alternatives 1, 1M, and 3 would not require a project-specific amendment to suspend the requirement to retain all existing cavity habitat in MA 10. All treatment units would be managed to meet the 40% minimum snag level.

National Forest Management Act

The project complies with the National Forest System Land and Resource Management Planning rule of November 9, 2000, as amended by meeting Kootenai National Forest Land Management Plan direction for snags and cavity habitats and through the utilization of best science for potential impacts on cavity habitat and its MIS species.

DOWN WOOD HABITAT

Data Sources, Methods, Assumptions, Bounds of Analysis

Down wood habitat is woody material derived from tree limbs, boles, and roots in various stages of decay (Graham et al 1994), and performs many physical, chemical, and biological functions in forest ecosystems. Coarse down wood habitat is generally defined as any down wood material larger than 3 inches in diameter. The minimum piece size to qualify as a down “log” is 8 feet long with a large-end diameter of six inches or more (Bull et al 1997). The ecological processes and functions of down wood material are discussed in many research papers (e.g. Bull et al 1997; Graham et al 1994; Maser and Trappe 1984; Maser et al 1988). These are incorporated by reference.

Data sources for down wood habitat include District surveys for fuel loadings in proposed treatment units (see Fuels; Fuels Table 3-1).

The analysis boundary for project direct effects is the treatment units. Cumulative effects are analyzed at the PSU scale because the home range of several resident wildlife species with associations to down wood habitat extend further than the typical treatment unit.

Affected Environment/Existing Condition

The Forest Plan suggests that sufficient amounts of large down wood material be retained on site for wildlife habitat needs, nutrient release back into the soil, and site protection for timber stand regeneration. The current Forest Plan direction (USDA Forest Service 1987 A16-6) is to meet timber/silviculture Guideline #9, which is to leave logs greater than 12” diameter scattered throughout harvest units (a few pieces per acre). Five to 15 tons per acre is recommended depending on the associated VRU.

The project is designed to meet Guideline #9. Reserve trees are provided to assure future down wood habitat.

Environmental Consequences

Alternative 2

Direct and Indirect Effects

In the short-term, this alternative would not change the current condition or availability of coarse woody debris within the PSU due to the lack of action. Over time and in concert with continued fire suppression, this alternative could result in down wood concentrations in excess of natural conditions, especially in the drier ecosystems.

Effects Common to Alternatives 1, 1M, and 3

Direct and Indirect Effects

In proposed timber harvest units, implementing recommended down wood material guidelines under all alternatives is expected to ensure the maintenance of adequate habitat. Implementation of Forest Plan snag guidelines would maintain some cavity habitat and subsequent down wood habitat recruitment to the forest floor over the next several decades. Application of these guidelines in all harvest units would ensure distribution of down wood material across the landscape. Any snag felled due to OSHA standards would be required to remain on site. The forest guideline to leave 5-15 tons/acre of 12”+ diameter down wood is met.

Generally, all action alternatives have the potential to reduce down woody resources over several thousand acres under a variety of management actions (please refer to the Features of Alternatives in Chapter 2). Of the 7011 acres proposed for management under Alternative 1, 3007 acres involve some type of timber harvest where Forest Plan guidelines/recommendations for retention of down woody debris should be met. The remaining 4005 acres would be treated with prescribed fire where a minimum of 5 to 10 tons of down woody debris per acre would be maintained, depending on the VRU, for soils nutrient recycling. Alternative 3 proposes 5596 acres of treatment with 2801 receiving some type of timber harvest and 2795 with prescribed burns. Similarly, Alternative 1M proposes 5965 acres of treatment with 2115 involving timber harvest and 3850 acres of prescribed burns.

The proposed fuel treatment/wildlife habitat enhancement units (Alt 3 = 483; Alt 1M = 790 ac; Alt 1 = 811ac) would retain adequate down wood. Spring burning prescriptions and conditions should allow for the maintenance of larger pieces of organic matter on the forest floor. Fall burning may increase the risk of large woody consumption by fire, but fire-killed snags would be recruited over time. Site preparation methods are similar between the action alternatives (please see Chapter 2 for the differences in acres between alternatives). Grapple piling of logging slash can more easily separate fine fuels from coarse wood material. Charred coarse wood material with checks and cracks does not substantially interfere with the decomposition or function of this material.

There are areas proposed for roadside salvaging, as well as post and pole opportunities as part of this project. The potential for snag loss and subsequent down wood, as a result of these activities, was accounted for in the effects of road systems on snag capability in that any areas 100 feet from any road are considered to have a zero capability to produce snags and therefore, the larger down woody material.

The proposed improvement (relocation) of the Robinson Mountain trail to the old South Fork Young Creek Trail #238 may impact some down trees or snags, but since the old trail prism would be utilized, this impact is considered negligible. The potential for down tree or snag loss at the trailhead along the open road #7205 has already been accounted for in the effects of road systems on snag capability in that any areas 100 feet from any road are considered to have a zero capability to produce snags and therefore, the larger down woody material

Likewise, the parking area (approximately one acre) and road relocation (0.4 miles) associated with the proposed boat ramp may result in a minimal loss of down trees and snags to accommodate safe operation of vehicles. Due to the anticipated level of down wood/snag loss, impacts to the snag capability of the PSU and associated species are considered negligible. Renovation of the Robinson Lookout would not involve removal of any down wood to facilitate repairs, therefore this activity would not impact this resource.

There would be no measurable impacts on the down wood/snag resource from the renewal of existing special uses and outfitter and guide permits in the Young Dodge PSU because the disturbance from these actions has already been accounted for in the existing condition. There could be single snag removal, and subsequent down wood, in any situations where permitted facilities or personnel may be damaged or threatened by a standing (leaning) dead tree.

Cumulative Effects

Summary of the Existing Condition

In conjunction with naturally occurring events such as insect infestations, windstorms, and wildfires, fire suppression and certain logging practices have changed, and often reduced, the amount and distribution of these components across the landscape (USDA Forest Service 2000). Likewise, firewood cutting, a commonplace impact and one that is difficult to measure, contributes cumulatively to the existing condition of the current down woody debris resource through removal. All of these influences on the down woody resource can be expected to continue to varying degrees in years to come and would contribute both positively and negatively to the resource in that down woody debris would be both created and removed.

Effects of Current and Reasonably Foreseeable Actions

The Cumulative Effects Worksheet, located in the Wildlife section of the Project File, contains the detailed analysis of all past, current, and reasonably foreseeable activities listed in Tables 3-1 and 3-2 (pp III-2 through III-4). All activities identified to occur within the Analysis Area that have the potential to affect down woody debris are discussed below.

Vegetation Management and Fuels Reduction Activities

The Dodge Mountain Pine Beetle thinning unit (93 acres) is planned for 2012 at the southernmost boundary of the Young Dodge PSU. This timber stand improvement project may result in the loss of individual snags, and subsequent down wood, due to thinning activities or due to OSHA guidelines and were reflected under the No Action Alternative 2 effects on snags in Snag Table 3-3, above.

The action alternatives, in combination with other current and reasonably foreseeable vegetation related actions including tree planting, precommercial thinning, Christmas tree cutting, wreath bough collection, character wood collection (log furniture), and blowdown salvaging (see Table 3-2) would maintain the existing level of down wood by avoidance with the exception of wood possibly lost to character wood (furniture) gatherers and that lost to firewood gatherers. Most wood removed for furniture however is small diameter trees (<10" DBH) unsuitable for most cavity nesters and this impact is considered negligible. Down wood lost to firewood gatherers within 100 feet of a road has already been accounted for in the PPL for snags.

Livestock Grazing

Cattle grazing would not result in a change of old growth habitat, snags or down woody debris in the PSU, as it does not involve the harvest of trees, dead or alive.

Noxious Weed Treatment

Noxious weed management would result in no loss or change in snags and down woody debris because weed treatments primarily focus on the herbaceous layer along roads and in previously disturbed areas.

Fire Suppression

Fire suppression activities including the construction of fire lines, helispots, and safety zones could potentially result in impacts to specialized habitats (e.g. old growth, snags and down woody debris). The amount and timing of such a loss cannot be predicted; however, the number of snags, and subsequent down wood created by a wildfire would far exceed those lost during fire suppression efforts. Suppression activities are typically subject to input from District Resource Advisors, and protection of specialized habitats, including down wood, is considered.

Road Management Activities

Road management actions such as road maintenance and administrative use associated with permit administration, data collection, and monitoring of NFS lands are not likely to affect specialized habitats (e.g. old growth habitat, snags, down woody debris) because they generally do not result in vegetation removal. The down wood and snag component would only be affected if considered a hazard to road users. These activities would not result in any change to the snag component and subsequent down wood, thus no adverse cumulative effects would be expected.

Recreation Maintenance

Routine maintenance of trails and developed and dispersed recreation sites could involve the harvest of down wood that pose a hazard to forest users. However, the scale of the impact would be small and not measurable as a cumulative effect to down wood or associated species.

Special Uses

There are areas previously impacted by special use permits such as gravel pits, building sites (fire station), fish weir, utility corridors, private land access routes, and outfitter/guide trails that will continue to be present and utilized. The ground disturbance on resources such as snags and subsequent down wood have been included under the existing condition and would have no additional impacts.

Public Use

Firewood gathering would continue to remove some snags and down wood from the open road corridors and these acres were previously accounted for as part of the existing condition. Other public uses such as wildlife viewing, berry picking, camping, snowmobiling etc. have negligible impacts on these resources. While campers may utilize down wood for campfires this impact would also be negligible given the amount used for this purpose versus the abundant amount available.

Private Property

If private land owners build their estimated 12.5 miles of road and harvest an estimated 25 acres, there would likely be a decrease in the overall snag PPL and subsequent down wood within the PSU, but outside of NFS lands. These acres are reflected in under the No Action Alternative 2.

Other Lands

The state of Montana is proposing to thin 50 acres immediately adjacent to NFS lands in T37N, R28W. This activity could incidentally result in the removal of existing snags or when they pose a threat to forest workers according to OSHA. Being that these lands would only be thinned and not regenerated, there should be little cumulative impact to snag and subsequent down wood resources, however these acres were accounted for in Snag Tables 3-3 and 3-4.

Summary of Cumulative Effects

Cumulatively, with all lands considered, and all other reasonably foreseeable actions on private and state lands considered as described above, sufficient down woody debris would remain in the Young Dodge PSU.

The 2002 Forest Plan monitoring report (USDA Forest Service 2003) documents results for the past 16 years may be the best indicator that standing dead and down habitat is being retained via management guidelines and recommendations.

Regulatory Consistency

Forest Plan

There are no goals or standards for downed woody debris in the Kootenai Forest plan. It does contain the goal to: "Maintain diverse age classes of vegetation for viable populations of all existing native, vertebrate, wildlife species.... (FP Vol 1 II-1 Goal #7)". The Kootenai Forest Plan provides guidelines in Appendix 16, Cavity Habitat Management (FP Vol 2 App 16 6 - Guideline #9). All alternatives are consistent with the Kootenai Forest Plan, as a wide range of successional habitats, and associated amounts of downed wood would be available.

National Forest Management Act

The project complies with the National Forest System Land and Resource Management Planning rule of November 9, 2000, as amended by meeting Kootenai National Forest Land Management Plan direction for down wood and through the utilization of best science for potential impacts on this habitat resource.

MANAGEMENT INDICATOR SPECIES

Regulatory Framework

On December 18, 2009 the Department of Agriculture issued a final rule reinstating the National Forest System Land and Resource Management Planning rule of November 9, 2000, as amended (2000 rule) (74 FR 242 [67059-67075]). The 2000 rule states: Projects implementing land management plans must comply with the transition provisions of 36 CFR §219.35, but not any other provisions of the planning rule. Projects implementing land management plans must be developed considering the best available science in accordance with §219.35(a). Projects implementing land management plans must be consistent with the provisions of the governing plans. Based on the reinstated 2000 planning rule this project level analysis:

1) Considers the best available science in evaluating the effects on the species and

2) Considers how the action complies with applicable standards and guidelines in the Kootenai National Forest land management plan.

In addition, the analysis considers how the action provides for diversity of plant and animal communities based on the suitability and capability of the specific land area in order to meet overall multiple use objectives, and within the multiple use objectives of a land management plan adopted 16 USC 1604 (g)(3)(B).

The Kootenai Forest Plan (FP) (1987 Appendix 12) identifies management indicator species (MIS) (see MIS Table 3-1). The FP states "the maintenance of viable populations of existing native and desirable non-native vertebrate species, as monitored through indicator species, will be attained through the maintenance of a diversity of plant communities and habitats." (FP II-22)

MIS Table 3-1 Management Indicator Species

Species	Habitat Represented	Comments
Grizzly Bear (*Ursus arctos*)	General Forest	See T&E Section
Gray Wolf (*Canis lupus*)	General Forest	See Sensitive Species Section
Bald Eagle (*Haliaeetus leucocephalus*)	Rivers and Lakes	See Sensitive Species Section
Peregrine Falcon (*Falco peregrinus*)	Cliffs	See Sensitive Species Section
Elk (*Cervus elaphus*)	General Forest	Serves as MIS for Young Dodge Subunit
Whitetail Deer (*Odocoileus virginianus*)	General Forest	Represented by Elk
Mountain Goat (*Oreamnos americanus*)	Alpine	No alpine habitat in project area. Mtn. goats not found in project area. Project will have no impact on mtn. goats. No further analysis required.
Pileated Woodpecker (*Dryocopus pileatus*)	Snags, Old Growth	Also see old growth and snag sections

The FP identified a number of wildlife species that find optimum breeding and feeing habitat in old growth. Please refer to MIS Table 3-1 for those species present and addressed in the Young Dodge PSU.

Many of the KNF MIS species currently have other federal or state management status and are addressed in other sections of the wildlife resources analysis as shown in MIS Table 3-1. The pileated woodpecker is an inhabitant of old growth and a management indicator species (MIS) for old growth habitat on the KNF and is addressed in the following MIS section.

Elk and whitetail deer are two MIS species that represent similar habitat. Summerfield (1991) recommends determining which big game species will be featured in a particular area, since species winter requirements differ. Based on FP direction, the biological potential of the area, state wildlife management objectives, public comments during scoping and the information contained within the Kootenai Conservation Plan (Johnson 2004 Appendix H); an emphasis species was identified for this report.

As a general rule the following process was used to determine the featured species. In the Conservation Plan the KNF and MFWP Elk Task Force established management emphasis designations for elk by planning subunit (PSU) (Ibid: Appendix H Attachment B page H-12 and 2600 letter of 5-16-1997). In PSUs with high emphasis for elk, elk will be the emphasis MIS in the report. For PSUs where elk are a low emphasis, whitetail deer will be the indicator for general forest habitat in the report. For PSUs where elk are moderate emphasis, the project biologist will designate the general forest indicator, based on site-specific information about elk and deer use in the PSU. The Young Dodge PSU is moderate emphasis for elk and the elk has been chosen for the general forest indicator in the analysis.

ELK

Data Sources, Methods, Assumptions, Bounds of Analysis

Elk are one of the indicator species for general forest habitat condition. The Young Dodge project area is located in the Young Dodge PSU, which is identified as an area where elk are managed equally with the white-tailed deer, another general forest indicator species (KNF MFWP Elk Task Force 1997).

Elk population ecology, biology, habitat description and relationships identified by research are described in Murie (1979) and Toweill and Thomas (2002). That information is incorporated by reference. Elk population and harvest data come primarily from Montana Fish, Wildlife, & Parks (MFWP) data. Additional information used is from recent District wildlife observation records and Forest historical data (NRIS Wildlife).

The Analysis Area boundary for project impacts to individuals and their habitat is the Young Dodge PSU. The boundaries for determining population trend and viability is the MFWP elk hunting district # 100 (Purcell) and the Kootenai National Forest, respectively.

The effects analysis is based on direction provided in the Kootenai National Forest Plan (1987) as amended and Coordinating Elk and Timber Management (MFWP 1985). Additional guidance is provided by Defining Elk Security: The Hillis Paradigm (1991). Potential effects to elk habitat are identified by analyzing four effects indicators: cover/forage ratio, habitat effectiveness, security, and key habitat components.

Cover/Forage Ratio

Cover/forage ratio portrays the percentage of area that meets elk requirements for cover and forage. Cover provides protection from weather, predators, and humans. Two different types of cover have been recognized. Hiding cover is defined as vegetation capable of hiding 90% of an elk from the view of a human at 200 feet. Thermal cover is a stand of conifers that are 40 feet tall with 70% crown closure. Forage areas are those natural or man-made areas that do not qualify as cover (hiding or thermal) (Thomas 1979 pp 109 114 116). Recently, elk use of thermal cover and foraging areas has been reexamined and this research indicates that providing thermal cover is not a suitable solution for inadequate forage conditions (Cook et al 1998).

The Kootenai Forest Plan (1987) recommends a cover/forage ratio of 30/70% for elk winter range (measured on the combined acres in MA 10 and 11 lands). Summerfield (1991) recommends cover to be 60% on winter and summer range (measured on all MAs, not winter range, e.g. MAs 12, 15, 16, etc.). On elk winter range the cover should be at least 40% thermal cover (Ibid). Summer range cover may be in any combination of hiding and thermal cover (Ibid). The KNF Plan (1987) also identifies the general maximum size for an opening as 40 acres. Summerfield (1991) recommends that the opening size standard be the same as the standard for grizzly bear (a maximum of 600 feet to cover from any point inside an opening).

Cover/Forage ratio (C/F) for summer range (combined MAs 15, 16, 17 acres) in the PSU, C/F ratio for winter range in the PSU, the percent thermal cover on winter range, and the number of regeneration harvest units greater than 40 acres in size at the PSU scale are the measures for effects.

Habitat Effectiveness

The habitat effectiveness (HE) of an area refers to the percentage of habitat that is usable by elk outside of the hunting season that does not contain open roads. Numerous studies have shown that there is a strong negative correlation between elk use of an area and the density of open roads, even if those roads are only lightly traveled (Frederick 1991).

The FP calls for an open road density (ORD) in MA 12 (Big Game Summer Range and Timber) of 0.75 miles per square mile. This translates into a habitat effectiveness value of 68% (Lyon 1984). In MAs 15, 16, 17, and 18 the Forest Plan ORD standard is $\leq$ 3.0 miles per square mile, which equates to 38% habitat effectiveness.

The percent HE for the PSU, ORD for MA12, and ORD for the combined MA 15, 16, 17, and 18 lands in the PSU are the measures for effects.

Security

Security areas are defined as areas that are larger than 250 contiguous acres in size and more than one half mile from an open road (Hillis et al 1991). These areas offer elk refuge through reduced vulnerability during the hunting season and can greatly influence the age structure and composition of a herd.

The FP has no standard for security. A panel of state and federal wildlife biologists convened in 1996 and produced, "Integrating Kootenai National Forest Plan and Fish, Wildlife & Parks Elk Management Plan Final Task Force Report (Johnson 2004 Appendix H-B). This document identified security as an important component in elk habitat and that the Hillis et al (1991) method would be used to calculate it. This method recommends a minimum of 30% of an elk's fall use area be maintained as security habitat. Since elk use in the fall could be any place within a PSU, the 30% minimum is measured against the PSU NFS acres. Appendix H-B (Johnson 2004 p H-12) also provides the elk management emphasis level by PSU, as well as definitions for security levels (H-B-13).

The percent security in the PSU will be the measure for effects.

Key Habitat Components

Wallows, wet meadows, and bogs will be avoided when constructing roads (Kootenai Forest Plan 1987; III-44 49). When these areas are located they will be mapped and managed as riparian areas.

The number of features potentially impacted by the project will be the measure for effects.

Affected Environment/Existing Condition

The Young Dodge PSU is located in elk hunting district #100 (Purcell). The population in the hunting district is stable (MFWP 2004 p 66). Currently, the cover/forage ratio is approximately 95/5%, habitat effectiveness is approximately 65% within MA 12 and 75% within MAs 15 and 16, and 31.2% of the PSU is secure habitat (MIS Table 3-2). The PSU is managed with a moderate emphasis for elk (Johnson 2004 App H-B p H-12). The number of wallows in the PSU is unknown; however, one likely wallow was found during field visits to proposed treatment units to date and was protected as such. Calving areas are known to occur in the PSU, have been tracked (mapped) as such since at least 1994, were recently re-created (2011; Vol 5, Doc 329) in GIS for access management direction, and included in the Project File for this analysis.

Environmental Consequences

Direct and Indirect Effects - No Action Alternative 2

Cover/Forage Ratio

Under Alternative 2 (no action) the cover/forage ratio would remain unchanged, in the short-term. However, as trees and shrubs continue to grow and mature the number of acres of productive foraging habitat would decline. As trees continue to encroach upon forage openings and tree canopies close, the quality of forage and number of acres producing forage decline. The increased tree density and continuous fuel profile from the ground up to the main canopy puts the area at risk of severe wildfire (See Fuels section for additional information). If severe wildfires occur, it is likely that forage habitat would be greater than 600 feet from cover, making it less likely to be used by elk and other large mammals.

Open Road Density and Habitat Effectiveness

Open Road Densities (see MIS Table 3-2 below) and Habitat Effectiveness for MA 12 and MAs 15 / 16 would remain unchanged at 65% and 75% respectively, under Alternative 2.

Security

Secure habitat for elk would remain unchanged (31.2% of the PSU) under Alternative 2.

Special Habitat Features

Under Alternative 2 no wetland acres would be impacted since no timber harvest would occur within the Streamside Management Zone of any wetlands.

Direct and Indirect Effects - Action Alternatives

Cover/Forage Ratios

Each action alternative includes prescribed burning (see alternative descriptions), which would occur primarily on south and west slopes that make up big game winter range. Burning would improve the palatability and enhance the quality of the forage produced on these acres.

Cover/Forage ratios on winter range would shift toward the Forest Plan Standard because of timber harvest in MAs 10 and 11 (MIS Table 3-2). Alternatives 1, 1M, and 3 result in similar changes to the cover/forage on winter range, harvesting 803 acres, 713 acres and 798 acres, respectively.

Summer range cover/forage ratio would become 87/13 (MIS Table 3-3) under Alternative 1, which is the largest change in this ratio. All action alternatives include units that would result in openings greater than 40 acres. This could result in openings that may not be fully utilized by elk as foraging areas. However, stringers and groups of trees would be left within the units to provide screening and minimize the effect of the openings when possible. There may be short-term disturbances within identified big game travel corridors due to project related activities. Timber management in Riparian Habitat Conservation Areas would follow INFS guidelines and the state of Montana Streamside Management Zone law, ensuring the maintenance of travel corridors within riparian zones. Vegetated corridors facilitating movements in elevation would be maintained (see Cover/Forage maps in the Project File).

Other project proposals including the Robinson Mountain trail relocation (to the old South Fork Young Creek Trail #238); its corresponding trailhead; the Young Bay boat ramp/parking area/access road; and the Robinson Lookout renovation would have no measurable impact on the cover to forage ratio for elk due to either their limited scope or by lack of existing cover. Open Road Density and Habitat Effectiveness

None of the action alternatives would increase the ORD within MA 12. Therefore, habitat effectiveness would remain at levels equal to or better than the existing condition (see MIS Table 3-2). All roads utilized to facilitate management activities would remain closed to the general public, therefore, not affecting the ORD. Under Alternative 3, ORD would meet the 0.75 mi/mi2 standard, with an HE of 68% during all management activities. This would involve closing 1.36 miles (equates to 5.4 acres) of currently open road. The MA 12 ORD standard (<0.75 mi/mi2) is not met in Alternatives 1, 1M or 2. Implementation of Alternatives 1 or 1M would require a programmatic Forest Plan amendment. Under Alternatives 1 or 1M, following completion of all harvest related activities, ORD would return to no more than 0.81 mi/mi2. Alternative 3 would maintain the MA 12 ORD at 0.75 mi/mi2 following the completion of activities.

MIS Table 3-2 shows the PSU ORD in MAs 12, and 15/16. All alternatives are well below the Forest Plan standard of <3.0 mi/mi2.

Other project proposals including the Robinson Mountain trail relocation (to the old South Fork Young Creek Trail #238); its corresponding trailhead; the Young Bay boat ramp/parking area/access road; and the Robinson Lookout renovation would have no measurable change on the existing road densities of corresponding management areas due to the lack of need for access, the existence of access, or the exchange of roaded access. Security

Roads needed for implementation of management activities would not be open to the general public and would therefore not affect elk security during the hunting season. Temporary displacement of elk or species avoidance during harvest activities may occur. Avoidance by elk or displacement from local areas would be temporary and extend only through the life of the project. Upon completion of all activities related to this analysis, big game security in the PSU would remain at least 31.2%, no matter the alternative. Secure displacement habitat exists adjacent to the PSU in the Boulder Sullivan PSU. Access to secure habitat would be maintained throughout the life of the project.

There would be no measurable impacts on elk security from the renewal of existing special uses and outfitter and guide permits in the Young Dodge PSU because the facilities, utility corridors, or use areas are already established and their impacts (also to cover, road densities, special areas etc.) were accounted for under the existing condition. There are also no proposals for expansion of these permits under this project.

Other project proposals including the Robinson Mountain trail relocation (to the old South Fork Young Creek Trail #238); its corresponding trailhead; the Young Bay boat ramp/parking area/access road; and the Robinson Lookout renovation would have no influence elk security due to the lack of change to the open road baseline. Special Habitat Features

Impacts to special habitat features, by alternative, are summarized in MIS Table 3-2 above. Due to implementation of specific design criteria to buffer these features, and/or the timing restrictions on management activities, potential displacement of elk using these features is not likely to occur.

Other project proposals including the Robinson Mountain trail relocation (to the old South Fork Young Creek Trail #238); its corresponding trailhead; the Young Bay boat ramp/parking area/access road; and the Robinson Lookout renovation, and special use permits would have no impact on special areas by avoidance and thru consultation with wildlife personnel.

MIS Table 3- 2 Direct and Indirect Effects to Elk Habitat Components

Habitat Component	Alt 1	Alt 1M	Alt 3
Change (%) in PSU Cover/Forage Ratio Summer Range (guide 60/40) (non-winter range MAs, 12, 15, 16, etc.)	-8/+8	-6/+6	-7/+7
Change (%)in PSU Cover/Forage Ratio Winter Range (MA 10 &11) (guide 60/40)	-8/+8	-7/+7	-8/+8
Change in Thermal Cover % Winter range (MA 10 & 11) (guide ≥ 40%)	-8.5/+8.5	-7.6/+7.6	-8.5/+8.5
Change in PSU Security cover %	0	0	0
Change (%) in MA 12 effectiveness during/after	0/0	0/0	0/0
Change (%) in MA 15/16 effectiveness	0	0	0
Change in MA 12 open road density (mi/mi^2) during implementation / following implementation	0/0	0/0	-.06/.06
Change in PSU Open Road Density (mi/mi^2) (MA 15,16)	0	0	0
New Openings >40 acres - all summer range including MA 12*	10	8	11
# Special Habitat Features impacted (if known) \1	0	0	0
# Movement Areas Affected in MA 12 and other summer MAs	4	2	0

\1 Project design includes requirement to buffer special habitat features if found during project layout.
*Created since 1992, considers 600 feet to cover thus combining units closer than 600 feet in adjacency that will result in openings greater than 40 acres and calculated in ArcGIS.

In summary, each of the action alternatives proposes activity in big game habitat. Alternatives 1, 1M, and 3 begin the process of shifting the cover/forage ratio toward one more suitable for elk with no reduction in security. Some short-term displacement of big game may occur when harvest occurs in movement corridors or as localized disturbance occurs during the life of the project.

The management activities and resulting changes in habitat conditions disclosed above are likely to result in short-term displacement effects on elk. Elk numbers are not expected to change dramatically, however with increased forage availability and maintained security levels the population could show a slight increase.

Cumulative Effects

Summary of the Existing Condition

Briefly, forest management practices and other human activities (e.g. hunting, wood consumption, motorized recreation) have had influential cumulative impacts on elk and other big-game security, as well as measurable fluctuations in cover to forage ratios. While natural events such as wildfires can result in dramatic and immediate changes to big-game cover, and will continue to do so, it is the indirect effects of forest management that have likely had the greatest impact to big-game habitat in the form of road construction and associated uses. Use of these roads, whether for logging, recreation, or hunting, decrease elk and other big-game security (increasing vulnerability or risk of mortality), decrease habitat availability via temporary displacement, and can increase stress levels of resident species. The formulation and adherence to Forest Plan standards for open and total road densities has been and will continue to be an important tool to mitigate the associated cumulative impacts to elk and other big-game. On occasion, projects like the Young Dodge PSU FSEIS may not meet all FP direction and have short-term impacts on large roaming species, however, in the long-term they, like Young Dodge, are designed to decrease the frequency of vegetation management actions and create larger contiguous blocks of interior habitat, both which are beneficial to the species.

Contrarily, forest management has also contributed positively to elk and big-game habitat. Logging and prescribed burning have worked successfully to cycle forest cover through the many periods of succession. These vegetation treatments have been especially important given the many years of wildfire suppression activities, thus controlling wildfires that would have naturally kept a percentage of the forest in early successional stages that provided the primary foraging element of big-game habitat. Continued implementation of the Appropriate Management Response strategy utilized to help determine the agency's reaction to wildfires is expected to play an increasing role in future management of elk and big-game habitat.

MIS Table 3-3 Cumulative Effects to Elk Habitat Components

Habitat Component	Existing Condition Alt 2	Alternative 1	Alternative 1M	Alternative 3
Total Change in PSU Cover/Forage Ratio Summer Range (guide 60/40) (non-winter range MAs, 12, 15, 16, etc.)	95/5	87/13	89/11	88/12
Total change in PSU Cover/Forage Ratio Winter Range (MA 10 &11) (guide 60/40)	95/5[#]	87/13	88/12	87/13
Total change Thermal Cover % Winter range (MA 10 & 11) (guide ≥ 40%)	80/20	71.5/28.5	72.4/27.6	71.5/28.5
PSU Security Cover % (guide ≥30%)	31.2%	31.2%	31.2%	31.2%
MA 12 Effectiveness (%) (guide ≥68%) – during / after	65% / 65%	65% / 65%	65% / 65%	68% / 68%
MA 15/16 Effectiveness (%) (guide ≥38%)	75%	75%	75%	75%
MA 12 Open Road Density (mi/mi^2) during implementation / following implementation (std. ≤ 0.75)	0.81 / 0.81	0.81 / 0.81	0.81 / 0.81	0.75 / 0.75
PSU Open Road Density (mi/mi^2) (MA 15,16) (std. ≤3.0)	0.53	0.53	0.53	0.53
# Openings > 40 acres - all summer range including MA 12*	7	17	15	18**
# Special Habitat Features impacted (if known) \1	0	0	0	0
# Movement Areas Affected in MA 12 and other summer MAs	0	4	2	0

\1 Project design includes requirement to buffer special habitat features if found during project layout.
*Created since 1992, considers 600 feet to cover thus combining units closer than 600 feet in adjacency that will result in openings greater than 40 acres and calculated in ArcGIS.
**Unit acres exceed 40, however, no point in the units within MA 12 exceed 600 feet from cover.
[#] Approximately 125 acres of winter range could be impacted on private and state lands, however, these limited amount of acres are too small to account for one percent of change on the existing condition.

Effects of Current and Reasonably Foreseeable Actions

The Cumulative Effects Worksheet, located in the Wildlife section of the Project File, contains the detailed analysis of all past, current, and reasonably foreseeable activities listed in Tables 3-1 and 3-2 (pp III-2 –III-4). All activities identified to occur within the Analysis Area that have the potential to affect the Management Indicator Species are discussed below.

Vegetation Management and Fuels Reduction Activities

The Dodge Mountain Pine Beetle thinning unit (93 acres) is planned for 2012 at the southernmost boundary of the Young Dodge PSU. This timber stand improvement project may result in a slight alteration of cover, however, will certainly improve foraging conditions on ungulate winter range.

The action alternatives, in combination with other current and reasonably foreseeable vegetation related actions including tree planting, precommercial thinning, Christmas tree cutting, wreath bough collection, character wood collection (log furniture), and blowdown salvaging (see Table 3-2) would not measurably contribute to cumulative impacts on elk cover, security, habitat effectiveness, or special areas as they do not involve creating or opening roads and have little to no impact on cover.

Livestock Grazing

Although grazing allotments cover several thousand acres of the PSU, competition between cattle and resident ungulates for forage is not expected to be an issue. Domestic cattle typically utilize forage areas readily available along roadsides and recently harvested areas that have more gentle slopes whereas resident ungulates are more widespread across the landscape.

Noxious Weeds

Weed treatment activities would not lead to any adverse effects on elk or their habitat because treatment of weeds would actually benefit forage species important to elk and other big game species (USDA Forest Service 1997 p30).

Fire Suppression

In the event of a wildfire, construction of fire lines, helispots, and safety zones could potentially result in displacing elk and other big game from site specific areas until the event is contained. Upon completion of wildfire suppression activities, rehabilitation of these same areas can create micro-foraging areas because these sites are seeded for soil stabilization.

Road Management Activities

Road management actions such as road maintenance and administrative use associated with permit administration, data collection, and monitoring of NFS lands are not likely to measurably contribute to the cumulative impact on elk habitat due to their limited scope (time and space). On occasions when high use areas may be impacted, such as calving areas, impacts would be mitigated with design criteria including timing restrictions.

Although water restoration projects may temporarily displace elk and other wildlife from a localized area, they typically benefit wildlife in the long-term by increasing security, providing pulses of foraging when seeded, or by simply stabilizing soils where certain habitat components can remain available (see Water and Transportation Sections).

Recreation Maintenance

Actions such as road or trail maintenance and administrative use associated with permit administration, data collection, and monitoring of NFS lands are not likely to measurably affect elk and other big game species. These species will typically simply avoid the disturbance area until human activities terminate, which usually comprises of a few hours.

Special Uses

There are areas previously impacted by special use permits such as gravel pits, building sites (fire station), fish weir, utility corridors, private land access routes, and outfitter/guide trails that will continue to be present and utilized. The ground disturbance on resources such as elk winter range, habitat effectiveness and cover etc. have been included under the existing condition and would have no additional impacts.

Public Use

Other public uses such as wildlife viewing, berry picking, firewood gathering,camping, snowmobiling etc. have negligible impacts on elk given their limited scope (time and space). Infrastructure, such as roads and campgrounds, that facilitate these activities have already been accounted for under the existing condition.

Private Property

If private land owners build their estimated 12.5 miles of road and harvest an estimated 25 acres, there would likely be a slight impact on elk cover and security, especially on winter range where most privately owned acres occur. These acres are reflected in under the No Action Alternative 2.

Other Lands

The state of Montana is proposing to thin 50 acres immediately adjacent to NFS lands in T37N, R28W. This activity could incidentally result in the removal of cover and security on winter range. These acres are reflected in under the No Action Alternative 2.

Summary of Cumulative Effects

Timber sales and other management projects, such as salvaging, road work, precommercial thins, and fuels reductions, listed in the tables mentioned above may have temporary effects on elk and other big game. These effects may include avoidance of activity areas, increase in vulnerability during the hunting season, raised stress levels, and short-term displacement from key habitats, like foraging areas or wallows. Although these effects may occur, they are not expected to result in lower elk populations due to the utilization of seasonal design criteria, such as avoidance of the calving season. Contrarily, vegetation management activities can have beneficial effects, once management activities cease, by providing additional and or reconditioned areas of big game foraging. Other forest activities such as hiking and berry picking are thought to have minimal impacts to elk, typically resulting in temporary (hours) avoidance of an area.

The temporal occurrence of forest uses such as summer activities (camping, hiking, and berry picking) versus fall (hunting and firewood cutting) or winter (skiing and snowmobiling) activities, and the scheduling of management actions to avoid key time periods (spring calving and nesting) when wildlife may be more sensitive to human disturbances, allow for the avoidance of measurable cumulative impacts to wildlife. There may be some situations where isolated or localized cumulative effects may occur, due to an overlap of forest activities, but these situations are typically short in duration, and do not persist through the lifecycle of any one species, either temporally or spatially.

REGULATORY CONSISTENCY

Forest Plan

All alternatives meet Forest Plan direction for big game species (FP Vol 1 II-1 #12) by maintaining appropriate amounts and quality of suitable habitat in order to maintain species viability.

All alternatives, with their associated Forest Plan amendments and Regional Forester approval for the over 40 acre unit request, are consistent with the Kootenai Forest Plan (1987) by meeting FP or best science habitat parameters which in turn maintain available and suitable habitat .

Alternatives 1, 1M, and 2, with their associated Forest Plan amendments approving an open road density of 0.81 mi/mi2 within MA-12 (FP Vol. 1, III-51 #3), will be consistent with the Kootenai Forest Plan (1987) because it maintains habitat effectiveness levels (68%) supported by best science. The 5.4 acres made unavailable under these alternatives is considered negligible compared to the 319,170 acres of MA 12 available on the Forest (Johnson 2006).

State Elk Plan

The PSU is located in the Purcell Elk Management Unit identified in the MFWP Statewide Elk Management Plan. The proposed project is consistent with that document by maintaining viable populations of resident elk for hunting based on FP monitoring (USDA 2008).

SUMMARY MIS STATEMENT FOR ELK (GENERAL FOREST)

Based on the analysis for elk and the other general forest habitat indicators and the KNF Conservation Plan (Johnson 2004), habitat for general forest species should provide sufficient quality and quantity of the diverse age classes of vegetation needed for viable populations. Since sufficient general forest habitat is available, the populations of species using that habitat should remain viable. According to Item C-2 of the 2008 KNF Forest Plan Monitoring and Evaluation Report (FY 2007), "the aerial survey data on elk numbers show an increase since the last 5 year report (FY 2002). The numbers of elk observed during surveys increased from 1,778 in 2002 to 1951 in 2007, with incremental increases each of the last 5 years. The average number of calves per 100 cows remained about the same, going from 31 (2002) to 28 (2007). Elk populations increased through 1990 or 1991 and then had a gradual decrease until 1997. The downward trend appears to have reversed from the previous 5 year reporting period (1998-2002)." This upward trend is indicative of a viable population although still below the fifth decade goal of 7700 elk of the 1987 FP. This estimate is considered very conservative given many elk would not be seen via aerial flights only.

PILEATED WOODPECKER

Data Sources, Methods, Assumptions, Bounds of Analysis

Pileated woodpecker (PWP) population ecology, biology, habitat description and relationships identified by research for the northern Rocky Mountains are described in McClelland & McClelland (1999), McClelland (1979 1977), McClelland et al (1979), and Warren (1990). Research conducted in the Pacific and Inland Northwest is described in Bull and Holthausen (1993), Bull et al (1992), Bull (1987 1980 1975), Bull and Meslow (1977), Mellen et al (1992), Mellen (1987), Thomas (1979), Mannan (1977), and Jackman (1974). This information is incorporated by reference.

Pileated woodpecker occurrence data comes from recent District wildlife observation records, the Region One Landbird Monitoring Program (Avian Science Center, Univ. of Montana), and Forest historical data (NRIS Wildlife). The pileated woodpecker is the indicator species for old growth and snag habitat on the Kootenai National Forest. Habitat for this species was modeled using all designated and undesignated old growth habitat and old growth replacement habitat, which has currently been mapped for the Kootenai National Forest.

The analysis boundary for project impacts and cumulative effects to individuals and their habitat is the Young Dodge PSU based on their average territory described below. The boundary for determining trend or viability is the Kootenai National Forest.

Effects Indicators

The potential population index (PPI) for PWPs on the Kootenai National Forest has been calculated by Johnson (2003). The procedure is based on the assumption that all currently mapped effective and replacement old growth habitat (both designated and undesignated) is providing suitable habitat to support nesting territories. This assumption also includes the premise that all suitable habitat is spatially distributed across the landscape in a pattern that can be incorporated into individual nesting territories. The procedure was based on territory sizes of pileated woodpeckers as described in research by McClelland (1977) for northwest Montana, and Thomas (1979) and Bull and Holthausen (1993) for northeast Oregon. For the PPI analysis on the Kootenai National Forest (Johnson 2003b), replacement old growth habitat was defined as habitat that had some old growth characteristics, but did not meet the FP definition of old growth, or the definition found in Green et al (1992).

Effective old growth habitat was modeled as supporting one nesting pair per 600 acres, with replacement old growth habitat supporting one nesting pair per 1000 acres. The difference in territory size is based on research that suggests that higher quality habitat can support a breeding pair with fewer acres (McClelland 1977; Bull and Holthausen 1993). Also, allowing for larger territory sizes when habitat becomes fragmented appears reasonable, as territory sizes up to 2600 acres have been reported for western Oregon (Mellen et al 1992). Of course, there are numerous and complex interrelated factors that influence the actual size of the home range territory (McClelland 1977).

Project impacts are evaluated based on impacts to important attributes of pileated woodpecker habitat, primarily impacts to designated and undesignated old growth habitat. Specific features of old growth stands evaluated for project impacts include preferred nest tree species and size, down logs (both size and quantity), basal area (BA), and canopy closure (CC).

The overall assessment of habitat quality also accounts for potential negative factors discussed in the old growth habitat analysis that relate to patch size and connectivity, and include fragmentation, edge effect, and lack of interior habitat. Risk to firewood cutting is also evaluated. Other stands (not designated as old growth) may have one or more important attributes of old growth forests, or perhaps provide for connectivity and interior habitat. These stands were also reviewed as part of this analysis.

Affected Environment/Existing Condition

The modeled minimum PPI for the pileated woodpecker on the Kootenai National Forest is 425 nesting or breeding pairs (Johnson 2003). This is within the calculated historic range of variation for the minimum potential population index of 335 to 554 breeding pairs (Johnson 1999).

A detailed summary of old growth habitat for the Young Dodge PSU is displayed in the Old Growth section of this document. This summary indicates that approximately 2917 acres of effective old growth habitat (both designated and undesignated), and about 1167 acres of replacement habitat (both designated and undesignated) exist within the PSU. Existing pileated woodpecker nesting territories will likely encompass a significant portion of this old growth habitat. Based solely on the quantity of old growth habitat available, the Young Dodge PSU could support about 5 nesting territories (PPI).

Breeding bird point count surveys have been conducted on the Kootenai Forest since 1994. In this program, transects consisting of multiple bird monitoring points are set up within a wide range of habitats distributed geographically across the Kootenai National Forest. This survey technique is not specifically designed to census woodpecker species, although all migratory and resident bird species detected by specialists trained in bird identification are recorded at each point on each transect. The rate of detection can vary greatly from year to year, especially for a wide-ranging species like the pileated woodpecker, that may or may not be anywhere near a given point on a given day. During the 1994-2002 period, the pileated woodpecker was tallied 184 times at the 2638 individual points surveyed (USFS 2003). One of the transects was within the PSU.

There are no known active PWP nest cavities in the Young Dodge PSU although individuals and numerous feeding sign of this species have been seen during field visits to the area. The presence and signs of pileated woodpeckers remain largely undocumented because of their common occurrence.

Environmental Consequences

Analysis of Direct and Indirect Effects

Alternative 2 (No Action)

Under Alternative 2, natural successional processes would continue to occur throughout existing old growth stands, and stands containing old growth attributes used by pileated woodpeckers. Habitat would be provided for PWP nesting pairs that find suitable feeding and breeding conditions provided by the structural features and overall environment within these stands. There would be no change in PPI (see MIS Table 3-3 below).

Replacement old growth habitat currently provides less suitable stand conditions for territory occupation. Over the next several decades, in the absence of catastrophic fires or windstorms, these stands would develop better habitat features for pileated woodpeckers such as larger trees, larger snags, and more down logs. Also, higher levels of decadence would develop producing better substrate for food resources such as carpenter ants and their larvae, one of the primary prey items for pileated woodpeckers in the Northern Rockies (McClelland & McClelland 1999 1977) and in the Pacific and Inland Northwest (Bull et al 1992; Bull 1987 1975; and Bull et al 1980).

Under Alternative 2, no active management is expected within effective or replacement old growth habitat, with the exception of fire suppression activities. Continued disruption of the historic pattern of frequent fires in the drier ponderosa pine/Douglas-fir cover type would continue to result in ecological changes, such as the encroachment of Douglas-fir saplings in the understory. Eventually, these sites would develop a higher percentage of Douglas-fir trees, snags, and down logs more suitable as foraging habitat for pileated woodpeckers.

Over the next several decades, this successional trend may result in a reduction in quality PWP nest trees (ponderosa pine), since Douglas-fir was not found to be important for pileated woodpecker nest cavity excavation in the northern Rocky Mountains (McClelland & McClelland 1999 1977; Weydemeyer & Weydemeyer 1928), in northeast Oregon (Bull 1987 1975; Thomas 1979), or in British Columbia (Harestad & Keisker 1989).

Under this alternative, the impact of the existing road system on snags, an important attribute of the pileated woodpecker territory, would remain as described under the analysis for snags and old growth habitat. The effects of edge on pileated woodpecker habitat from adjacent regeneration units would also remain as described under the old growth analysis.

Alternatives 1, 1M, and 3

Impacts to old growth habitat are disclosed in the Old Growth section. These effects translate to potential impacts to the pileated woodpecker as loss of nesting and foraging habitat or reduced habitat quality.

Habitat impacts from the action alternatives would not result in the loss of old growth in any established category. However, they would result in an increased edge effect of 241 acres in Alternative 1, 217 acres in Alternative 1M, or 181 acres in Alternative 3 due to proposed adjacent harvest acres (see Old Growth Table 3-3 in the Old Growth section).

None of the action alternatives propose road construction adjacent to or through designated old growth; therefore, there would be no increase in risk of snag loss in old growth due to firewood cutting in addition to those effects previously disclosed under the effects to old growth.

Under Alternatives 1 and 1M, treatments to reduce the vertical structure within both designated and undesignated old growth are proposed in approximately 373 acres in conjunction with prescribed fire to assist in reducing fuel loadings. An additional 224 acres of prescribed burning, without pre-treating the vertical structure, is proposed in old growth as well. These activities have the potential to both reduce and create pileated woodpecker feeding and nesting habitats. The vertical structure treatments and fuel treatments however, are not expected to affect the canopy closure, tree species present, basal area of the large diameter trees, nor the overall snag capacity of these stands. Likewise, these proposed management activities would not affect the continuity of pileated woodpecker habitat or old growth stands given that no commercial size timber would be removed from old growth stands.

Alternative 3 was designed to meet the intent of Forest Supervisor Paul Bradford's letter of April 13, 2007, in that project analyses must include an alternative in addition to the No Action alternative, which does not propose any treatments (including prescribed fire) in any type of old growth.

Based on the expected impacts to old growth acres from the action alternatives, (see Old Growth Table 3-3 in the Old Growth section) the PPI is not expected to change as seen in MIS Table 3-4, below.

Project activities (e.g. falling and yarding) are likely to cause PWPs to, at least temporarily, move away from the disturbed areas.

The proposed improvement (relocation) of the Robinson Mountain trail to the old South Fork Young Creek Trail #238 may impact some trees or snags in older stands and MA13, but since the old trail prism would be utilized, this impact would be minimal. The potential for tree or snag loss at the trailhead along the open road #7205 has already been accounted for in the effects of road systems on snag capability in that any areas 100 feet from any road are considered to have a zero capability to produce snags. The parking location has also been accounted for in areas 100 feet from a road and would likely impact some snags when considered a hazard.

The parking area (approximately one acre), restroom, and road relocation (0.4 miles) associated with the proposed boat ramp would not have a measurable impact on PWP habitat because of the limited scope. These facilities may result in the removal of individual snags when considered a safety hazard by OSHA. There are no mature forested stands at the Robinson Lookout therefore there would be no impact on the PWP due to its renovation.

There would be no impacts on any old growth or mature forest stands from the renewal of existing special uses and outfitter and guide permits in the Young Dodge PSU because the disturbance from these actions has already been accounted for in the existing condition or they would not involve the removal of vegetation.

Cumulative Effects

Summary of the Existing Condition

The past reduction of functional old growth as well as snags, as previously discussed, via forest management actions and natural occurrences have contributed cumulatively to the existing habitat conditions for the pileated woodpecker. Over time, these cumulative impacts have likely reduced both nesting and feeding habitat as well as the number of nesting territories within the PSU and on the Forest.

MIS Table 3-4 Cumulative Potential Population Index by Alternative

Analysis Area	Existing PPI	Alternative 2 No Action	Alternative 1	Alternative 1M	Alternative 3
Young Dodge PSU	5	5	5	5	5
Forest-wide	429	429	429	429	429

Effects of Current and Reasonably Foreseeable Actions

The Cumulative Effects Worksheet, located in the Wildlife section of the Project File, contains the detailed analysis of all past, current, and reasonably foreseeable activities listed in Tables 3-1 and 3-2 (pp III-2 -4). All activities identified to occur within the Analysis Area that have the potential to affect the pileated woodpecker are discussed below.

Vegetation Management and Fuels Reduction Activities

The Dodge Mountain Pine Beetle thinning unit (93 acres) is planned for 2012 at the southernmost boundary of the Young Dodge PSU. This timber stand improvement project is not within any type of old growth, however it is adjacent to one block of undesignated replacement old growth and one block of undesignated effective old growth. This unit would not result in cumulative edge effects to any old growth that may serve as PWP habitat, due to its prescription.

Cumulatively, the proposed activities (timber harvest, prescribed fire, ground fuel reduction) in designated and undesignated old growth would not reduce the amount and distribution of old growth below Forest Plan requirements. However, due to cumulative edge effects (see Old Growth Table 3-4 above) there may be reduced old growth quality for the PWP, such as resulting in less interior habitat and more edge where predation is more likely to occur or where noxious weed invasions are more likely to become established. However, given the level of impact and the quantity of old growth in the PSU, this effect should be minimal and would diminish in approximately 50 years (Russell and Jones 2001; Ripple et al 1991; Russell et al 2000). Private lands in the Young Dodge PSU were assumed to not provide any old growth, based on past harvest practices.

The action alternatives, in combination with other current and reasonably foreseeable actions including tree planting, precommercial thinning, Christmas tree cutting, boughs, pine cone collecting, and blowdown salvaging (see Table 3-2) would maintain the designated management level of old growth by avoidance. In the instance where existing old growth is burned or blown down, replacement old growth will be designated to account for this loss and be available for the PWP.

Livestock Grazing

Cattle grazing would not result in a change of old growth habitat or mature forest stands, snags or down woody debris in the PSU, as it does not involve the harvest of trees, dead or alive. Grazing cattle predominantly move along road systems and within past harvest units where an abundance of forage can be found.

Noxious Weed Treatment

Noxious weed management would result in no loss or change in snags and down woody debris because weed treatments primarily focus on the herbaceous layer along roads and in previously disturbed areas.

Fire Suppression

In the event of a wildfire, construction of fire lines, helispots, and safety zones could potentially result in impacts to old growth habitat and mature forest stands. Conversely, wildfire suppression also serves to preserve existing old growth and mature habitat. Suppression activities are typically subject to input from District Resource Advisors, and protection of special habitats, including old growth, is considered. However, if cumulative effects to old growth habitat result in the habitat no longer functioning as old growth, additional old growth habitat would be designated and managed as such.

Road Management Activities

Road management actions such as road maintenance and administrative use associated with permit administration, data collection, and monitoring of NFS lands are not likely to affect old growth, mature forested stands and other specialized habitats (e.g. snags, down woody debris) because they generally do not result in vegetation removal. The standing tree and snag component would only be affected if considered a hazard to road users. These activities would not result in any change to the quantity of old growth or similar habitats, thus no adverse cumulative effects would be expected.

Recreation Maintenance

Routine maintenance of trails and developed and dispersed recreation sites would not contribute to the cumulative impact on old growth or similar habitats because maintenance of these facilities do not typically involve removal of critical elements such as large trees or snags unless deemed to be a safety hazard to forest users. In this situation, the removal of a tree or snag is considered negligible.

Special Uses

There are areas previously impacted by special use permits such as gravel pits, building sites (fire station), fish weir, utility corridors, private land access routes, and outfitter/guide trails that will continue to be present and utilized. The ground disturbance on resources such as old growth have been included under the existing condition and would have no additional impacts.

Public Use

Firewood gathering would continue to remove some snags from old growth and similar habitats along open road corridors and these acres were previously accounted for as part of the existing condition. Other forest use activities such as mushroom and berry picking, camping, hunting, Christmas tree cutting, bough collection, etc have little to no measurable impact on old growth and mature stands because they are largely non-consumptive or rapidly re-established and would not contribute to the cumulative effect on this resource.

Private Property

If private land owners build their estimated 12.5 miles of road and harvest an estimated 25 acres based on 5 homesites, there would likely be a decrease in dry-site old growth or mature stands within the PSU, but outside of NFS lands.

Other Lands

The state of Montana is proposing to thin 50 acres immediately adjacent to existing old growth blocks in T37N, R28W. This activity should have beneficial effects on neighboring old growth in that the thinning may prevent old growth loss due to any wildfire initiating on these State lands. Being that these lands would only be thinned and not regenerated, there should be little cumulative edge effect to neighboring NFS old growth blocks or similar habitats.

Summary of Cumulative Effects

Alternative 2 would not contribute any cumulative effects. The Forest-wide PPI (see MIS Table 3-4 above) reflects cumulative changes from each alternative and all past, present, and reasonably foreseeable actions.

Alternative 1, 1M, or 3 would not measurably contribute to cumulative effects on pileated woodpecker habitat. Other planned management activities, such as prescribed burning in old growth, are expected to both create and reduce woodpecker feeding and nesting habitat equally. The potential for firewood cutters to reduce pileated woodpecker habitat coinciding with old growth habitat along forest roads was previously accounted for in the discussion of old growth. Likewise, the impacts of timber harvesting immediately adjacent to old growth areas, have also been disclosed under the old growth section. No other current or reasonably foreseeable activities occurring within the PSU (see Table 3-2) are expected to impact this resource since most are prohibited from occurring within old growth areas.

Based on the analysis for pileated woodpecker, the MIS for old growth, snags and down wood, and the KNF Conservation Plan (Johnson 2004), habitat for old growth forest species and cavity habitat users should be provided in sufficient quality and quantity to meet the needs for viable populations. Since sufficient old growth forest, and snag and down wood habitat is available, the populations of species using that habitat should remain viable.

REGULATORY CONSISTENCY

Forest Plan

All alternatives are consistent with Forest Plan direction for old growth (see old growth section).

All alternatives are consistent with Forest Plan direction for snags and down wood (see snag and down wood section).

All alternatives are consistent with Forest Plan direction to maintain diverse age classes of vegetation for viable populations (FP II-1 #7) by maintaining appropriate amounts and quality of suitable habitat in order to maintain species viability based on best science.

National Forest Management Act

The project complies with the National Forest System Land and Resource Management Planning rule of November 9, 2000, as amended by meeting Kootenai National Forest Land Management Plan direction for old growth and through the utilization of best science for potential impacts on old growth habitat and its MIS species.

OTHER SPECIES OF INTEREST

NORTHERN GOSHAWK

Data Sources, Methods, Assumptions, Bounds of Analysis

Goshawk population ecology, biology, habitat description and relationships identified by research are described in McGrath et.al. (2003) and Reynolds et al (1992).That information is incorporated by reference. Goshawk occurrence data comes from recent District wildlife observation records and Forest historical data (NRIS Wildlife). Goshawk habitat was modeled using TSMRS vegetation data filtered through a series of queries of associated habitat elements such as forest types, aspect, slope, and elevation (see project file). The potential population index (PPI) (habitat acres divided by average territory acres) was calculated using 5400 acres as the average goshawk pair territory (Reynolds et al 1992). Therefore, the analysis boundary for project impacts and cumulative effects to individuals and their habitat is the Young Dodge planning sub-unit. The boundary for determining trend or viability is the Kootenai National Forest.

Management Status

In 2004 the Region reevaluated the set of species that would be placed on the Sensitive Species List. A standardized process to evaluate each species was followed. The goshawk was not placed on the 2004 sensitive species list based on the criteria used. It was added to the list in 2005 (Kimbell 3/31/2005) because it had been previously petitioned for listing under ESA, remained a focal point of project appeals, and was a species of special interest with certain segments of the public.

The goshawk was to remain on the list until the Region completed new data collection and evaluation, at which time its status was to be reconsidered. The work of Samson (2005) provided the data and evaluation on which to base reconsideration of the goshawk status as sensitive. Based on these works, the Forest Wildlife Biologists across the Region asked the Regional Forester to remove the northern goshawk from the Region 1 sensitive species list in March of 2007. In July of 2007, the Regional Forester responded to the biologists request stating: “The Forest Service Manual (2670.5) states that Sensitive Species are those for which there is a significant current or predicted downward trend in population numbers/density and a similar downward trend in habitat capability that would reduce distribution of the species. Regional data collection and analysis demonstrates that neither condition exists; therefore, the species no longer meets the definition for “sensitive.” Due to this decision, the northern goshawk is no longer listed as a “sensitive” species for the Kootenai National Forest. The goshawk currently remains off the 2011 Region One Sensitive Species list for the KNF (Weldon 2011).

Affected Environment/Existing Condition

Goshawk observation and monitoring data indicates that goshawks are utilizing at least portions of the Young Dodge subunit. Surveys conducted in the summers of 2006 and 2007 confirmed their presence in the PSU. Johnson (1999) shows goshawk presence confirmed in all eight planning units on the Kootenai. At the end of 2008, Forest survey records show 37 nest sites, with four sites no longer in use (Project File Vol 5; Doc 332).

Goshawk habitat modeling identifies a conservative 5266 acres of primary goshawk habitat in the Young Dodge planning sub-unit based on the habitat parameters used for the modeling (see Project File). However, Brewer et al (2009) summarized reports from various research projects that indicate goshawks utilize a wide range of habitats for hunting including: forest edges with riparian, clear cuts and sage, as well as non-forested openings, dense forests, and open forests. Based on these findings, the Young Dodge PSU may provide as much as 28,054 acres of suitable habitat. Since most goshawk populations are thought to be limited by available food sources (Brewer et al 2009), the amount of habitat available for goshawks to forage becomes increasingly important. A conservation assessment by Samson (2005) also suggests the importance of goshawk foraging habitats and the varying age classes and structures suitable for a variety of prey species.

Based on the average goshawk pair territory and the modeled nesting habitat acres, the potential population index for the Young Dodge planning sub-unit is one goshawk pair. Using the nesting (modeled) habitat acres from Johnson (Ibid), the minimum PPI for the Kootenai National Forest would be 139 goshawk pairs. The most recent data show 37 known or suspected pairs and an additional ten known individual goshawks on the Forest (Project File Vol 5; Doc 332).

Research shows that while goshawks use structural components found in old growth (e.g. large diameter trees, high crown closure) those same components are also found in other age classes of forested habitat. Ten percent (2905 acres) of the Young Dodge PSU, below 5550 feet, is made up of MA 13 old-growth in both the designated effective and replacement categories. Additional information on old-growth conditions and its management indicator species, the pileated woodpecker, can be found in those respective sections.

Environmental Consequences

Goshawk Table 3-1 summarizes the changes in habitat acres and PPI due to each alternative.

Goshawk Table 3- 1 Cumulative Nesting Habitat and PPI Changes by Alternative

	Existing Condition	Alternative 2 (No Action)	Alternative 1	Alternative 1M	Alternative 3
Habitat Acres - Planning sub-unit (% change)	5266 acres (0)	-193** (-3.7)	-924 (-17.5)	-828 (-15.7)	-770 (-14.6)
PPI - Project Area Pair Territories	1 (0)	1 (0)	1 (0)	1 (0)	1 (0)
Habitat Acres (Forest-wide) (% change)	752,296 acres (0)	752,103 (-0.03)	751,372 (-0.1)	751,468 (-0.1)	751,526 (-0.1)
PPI - Forest-wide Pair Territories (% change)	139 (0)	139 (0)	139 (0)	139 (0)	139 (0)
Foraging Acres - Planning sub-unit (% change)*	15,640 acres (0)	193** (-1.2)	-1968 (-12.6)	-1691 (-10.8)	-1769 (-11.3)

*Foraging acres modeled are not mutually exclusive from nesting habitat acres affected. FS managed lands equate to approximately 30,878 of the acres within the Young Dodge PSU.

**These acres are foreseeable actions on NFS (93 ac), state (50 ac) and private lands (50 ac) and are assumed to provide both nesting and foraging goshawk habitat.

Analysis of Direct and Indirect Effects

The Young Dodge proposal would not impact any known goshawk nesting sites based on field surveys and monitoring, since no nests have been confirmed. Areas where goshawks have been documented to possibly nest have been purposely avoided by proposed management activities. The proposal would, however, alter between 770 and 924 acres (see Goshawk Table 3-1, above) of potential nesting habitat in the Young Dodge PSU, based on known habitat requirements for this species. Of modeled foraging habitat, totaling 15,640 acres, Alternatives 1, 1M, and 3 would alter approximately 1968, 1691, or 1769 acres respectively. Indirectly, these habitat alterations may temporarily displace goshawks and or their prey species from currently suitable habitat. Indirect effects on goshawks should abate after approximately 15 to 25 years depending upon the growing site. Impacts to prey could diminish as recent as 5 years following habitat alterations depending upon the species of prey (e.g. game birds, some songbirds, rodents, etc.)

The proposed improvement (relocation) of the Robinson Mountain trail to the old South Fork Young Creek Trail #238 may impact some trees or snags contributing to an MA13 block and other adjacent mature forest stands, but since the old trail prism would be utilized, this impact would be minimal. The potential for tree or snag loss at the trailhead along the open road #7205 has already been accounted for in the effects of road systems on snag capability in that any areas 100 feet from any road are considered to have a zero capability to produce snags. The parking location is not adjacent to any mapped old growth. These activities would have little impact to potential goshawk habitat, however the human disturbance associated with these recreation facilities could cause goshawks to temporarily avoid the areas depending upon their level of toleration and fidelity to any unknown nest site.

The parking area (approximately one acre), restroom, and road relocation (0.4 miles) associated with the proposed boat ramp would have no impact on goshawks because there is no known nest in this area (mapped) for that particular area. Goshawks could forage in the area depending upon the amount of human disturbance at any given time.

Likewise, are no old growth areas or mature forest stands near the Robinson Lookout therefore there would be no impact on goshawks due to its renovation. Additionally, the presence of goshawks at this elevation (~7500 feet) is unlikely and certainly influenced by the lack of forested stands similar to old growth.

There would be no impacts on the goshawk from the renewal of existing special uses and outfitter and guide permits in the Young Dodge PSU because the habitat disturbance from these actions has already been accounted for in the existing condition or they are outside of any old growth area. Likewise, any goshawks that may utilize these areas would have already adjusted (i.e. relocated) from existing sources of human disturbance.

In summary, the proposed alternatives (including Alternative 2) may impact individuals and/or their habitat, but would not contribute to a loss of species viability for the northern goshawk (FSM 2670.22). This determination is based on: 1) areas where goshawks are suspected to nest have been avoided by the proposed action; 2) the reduction of 'edge' effect and promotion of larger areas of interior forest via the management actions; 3) the limited amount of nesting and foraging habitat altered by the proposed action; 4) the distribution of habitat needed for viable populations on a Forest level would not be affected; 5) based on Region 1 reviews (Brewer et al 2007; Samson 2005) habitat for the northern goshawk is readily available and well-distributed and there is no evidence that goshawk numbers are declining based on increases in the amount, distribution, and connectivity of forested habitat since European settlement; decline in the level of timber harvesting in the region; and the natural succession of forested habitats.

Cumulative Effects

Summary of the Existing Condition

Cumulative changes in habitat and PPI levels are displayed in Goshawk Table 3-1. The existing condition includes the results from all past activities. Alternative 2 includes all reasonably foreseeable projects that were able to be modeled. Based on the modeled acres that are suitable as goshawk habitat versus the land area under federal management, it can be deduced that past activities and natural incidences of wildfires have contributed to cumulative altering of suitable and available goshawk habitat. As previously stated, approximately 15,640 acres or 50.1% of the federally managed land in the Young Dodge PSU (includes 5266 nesting acres), are currently modeled as suitable goshawk foraging habitat. When comparing this figure to the average recommended age class distribution for VRUs 3 through 9, where the majority of northern goshawk habitat would be found on the KNF, the Young Dodge PSU appears to be within the range (roughly 20 to 95% for these VRU's age classes greater than 101 years old) of historic vegetation patterns (Gautreaux 1999). The cumulative impact, however, becomes more evident when modeling potential goshawk nesting habitat, which is currently approximately 17% (or 5266 of 30,878 ac), falling slightly below this historic range of availability. Therefore proposed long-term vegetation management benefits should outweigh immediate impacts to existing goshawk nesting habitat.

Effects of Current and Reasonably Foreseeable Actions

The Cumulative Effects Worksheet, located in the Wildlife section of the Project File, contains the detailed analysis of all past, current, and reasonably foreseeable activities listed in Tables 3-1 and 3-2 (pp III-2-4). All activities identified to occur within the Analysis Area that have the potential to affect the goshawk are discussed below.

Vegetation Management and Fuels Reduction Activities

The Dodge Mountain Pine Beetle thinning unit (93 acres) is planned for 2012 at the southernmost boundary of the Young Dodge PSU. This timber stand improvement project is not within any type of old growth, however it is adjacent to one block of undesignated replacement old growth and one block of undesignated effective old growth. This unit would not result in cumulative edge effects to any old growth due to its prescription therefore having minimal impacts on any goshawks possibly utilizing the area old growth. Although no goshawk nests are known to this thinning unit, the acres of this project were accounted for under the No Action Alternative 2 in Goshawk Table 3-1, above.

The action alternatives, in combination with other current and reasonably foreseeable actions including tree planting, precommercial thinning, Christmas tree cutting, boughs, pine cone collecting, and blowdown salvaging, would maintain the designated management level of old growth by avoidance. Other than possibly annoying individual birds, human disturbance from these activities would have minimal impacts on area goshawks.

Livestock Grazing

Cattle grazing would not result in a change of old growth or mature habitats that provides nesting areas for this species, as it does not involve the harvest of trees, dead or alive. Additionally, changes to the grass/herbaceous layer of vegetation would not affect goshawk habitat characteristics and generally, due to the lack of ungulate forage in old growth and mature forest stands, cattle grazing is typically not an issue.

Noxious Weed Treatment

Weed treatment activities would not lead to any adverse effects on goshawks or their habitat because treatment of weeds would actually benefit forage species important to many species or their prey (USDA Forest Service 1997, 30). No loss or change in specific habitats (e.g. old growth, mature forests), including snags and down woody debris inhabited by prey species would result from this activity because weed treatments primarily focus on the herbaceous layer along roads and in disturbed areas.

Fire Suppression

With the direction to suppress all wildland fires on NFS lands, construction of firelines, safety zones, and other control structures could impact individuals on a site-specific basis. Avoidance of known goshawk nests would be attempted during suppression efforts but some impacts may still occur. Due to the unpredictable nature of wildfires, contributions of fire suppression to the cumulative effect on this species can only be surmised. Also refer to cumulative effects on old growth.

Road Management Activities

Although road restoration and maintenance projects (brushing, blading, gate repairs, culvert replacement etc.) may temporarily displace goshawks from a localized area or impact individuals, they typically benefit the species in the long-term, especially if the projects involve closing previously open road systems (refer to road decommissioning in Transportation/Water Sections. Also refer to cumulative effects on old growth.

Recreation Maintenance

Normal road and trail maintenance activities have the potential to remove nesting and foraging trees for goshawks if they are close to a trail or road and present a safety hazard. Effects would include removing site-specific, individual trees, and would not be expected to contribute measurably to the cumulative effect on the northern goshawk.

Routine maintenance of dispersed recreation sites would not contribute to the cumulative impact on old growth because maintenance of these facilities do not typically involve removal of old growth elements such as large trees or snags unless deemed to be a safety hazard to forest users. In this situation, the removal of a tree or snag is considered negligible.

Special Uses

Operations of outfitter/guides would not result in any change to general and specialized goshawk habitats (e.g. old growth or mature forests, snags or down woody debris), as they do not involve the harvest of trees. There would be no cumulative effects to goshawks or their habitats associated with these activities other than possible temporary and local avoidance of an area due to the presence of humans.

Permits associated with access to private homes, rights-of-way for utilities, and outfitter/guides are not expected to contribute cumulatively to the impact on goshawks because they are limited to previously disturbed and hardened sites like trails and roads. There are no known land exchanges planned within the PSU at this time. For a discussion of existing private lands, please see below.

Public Use

The temporal occurrence of forest uses such as summer activities (camping, hiking, and berry picking) versus fall (hunting and firewood cutting) or winter (skiing and snowmobiling) activities, and the scheduling of management actions to avoid key time periods (nesting, rearing) when goshawks may be more sensitive to human disturbances, allow for the avoidance of measurable cumulative impacts. There may be some situations where isolated or localized cumulative effects may occur, due to an overlap of forest activities, but these situations are typically short in duration, and do not persist through the lifecycle of the raptor, either temporally or spatially.

Other forest product activities occurring presently and typically on an annual basis are the gathering of pine cones, boughs and commercial gathering of Christmas trees. These activities occur throughout the PSU, and have little-to-no effect on the landscape due to the unspecific nature of the use and the low impact on the resources (foot traffic, hand tools). Additionally, Christmas trees are harvested from existing regeneration units, so this activity would have no cumulative effect on the specialized habitats of goshawks, such as old growth and riparian areas.

Private Property

If private land owners build their estimated 12.5 miles of road and harvest an estimated 25 acres based on 5 homesites, there would likely be a decrease in dry-site old growth within the PSU, but outside of NFS lands. Any cumulative effects to goshawks will be partially dependent on the duration (seasonal versus year-round) of use of these parcels and homes. Anticipated effects include species displacement, nest failure, habitat alteration and/or habitat loss. Other Lands

The state of Montana is proposing to thin 50 acres immediately adjacent to existing old growth blocks in T37N, R28W. This activity should have beneficial effects on neighboring old growth in that the thinning may prevent old growth loss, and therefore potential goshawk habitat, due to any wildfire initiating on these State lands. Being that these lands would only be thinned and not regenerated, there should be little cumulative edge effect to neighboring NFS old growth blocks as potential goshawk habitat. The disturbance associated with this activity may cause goshawks to avoid the area during implementation.

Summary of Cumulative Effects

Although, habitat changes, which add to those of the existing condition as previously described, would occur under the proposed action, the Young Dodge PSU will continue to provide habitat for resident goshawks. Following implementation of the proposed activities, the Young Dodge PSU is expected to continue to support at least one nesting pair of goshawk with minimal effect on the Forest level to this species due to perpetuation of suitable habitat.

Regulatory Consistency

Forest Plan

- All alternatives are consistent with Forest Plan direction to maintain a minimum of 10% old growth below 5500 feet in elevation in each third order drainage or compartment, or a combination of compartments (Kootenai Supplement No 85; supplement to FSM 2432.22).

- Based on April 26th, 2004 direction (Castaneda 2004), old growth will be analyzed at the PSU scale. After implementation of the action alternatives, the Young Dodge PSU would have 10.3% designated old growth below 5500 feet elevation. In addition, 1147 acres of undesignated old growth would remain. The most recent Forest-wide assessment as documented in the Forest Plan Monitoring and Evaluation Report (USDA Forest Service 2007) shows that the Kootenai National Forest has 11.6% old growth designated (includes both effective and replacement). The Kootenai Forest Plan established that maintaining 10% of old growth habitat is sufficient to support viable populations of old-growth dependent species (Vol 1 II-1 7; III-54; Vol 2 A17).

- All alternatives are consistent with Forest Plan direction to maintain diverse age classes of vegetation for viable populations (FP II-1 #7) by maintaining appropriate amounts and quality of suitable habitat in order to maintain species viability based on best science.

National Forest Management Act

- The project complies with the National Forest System Land and Resource Management Planning rule of November 9, 2000, as amended by meeting Kootenai National Forest Land Management Plan direction for other resident species and through the utilization of best science for potential impacts on old growth/mature habitats and their associated species.
- The project complies with NFMA direction (16 USC 1604 (G)(3)(b) to "provide for diversity of plant and animal communities based on the suitability and capability of the specific land area in order to meet overall multiple-use objectives, and within the multiple-use objectives of a land management plan adopted pursuant to this section, provide, where appropriate, to the degree practicable, for steps to be taken to preserve the diversity of tree species similar to that existing in the region controlled by the plan.

SENSITIVE SPECIES

Regulatory Framework

The sensitive species analysis in this document meets the requirements for a biological evaluation as outlined in FSM 2672.42.

Sensitive species are administratively designated by the Regional Forester (FSM 2670.5) and managed under the authority of the National Forest Management Act. FSM 2670.22 requires the maintenance of viable populations of native and desired non-native species and to avoid actions that may cause a species to become threatened or endangered.

The National Forest Management Act (NFMA) (36 CFR 219.19) directs the Forest Service to "provide for diversity of plant and animal communities based on the suitability and capability of the specific land area in order to meet overall multiple-use objectives." [16 U.S.C. 1604(g) (3) (B)]. Providing ecological conditions to support diversity of native plant and animal species in the planning area satisfies the statutory requirements [(36 C.F.R. 219.10(b)]. The Forest Service's focus for meeting the requirements of NFMA and its implementing regulations is on assessing habitat to provide for diversity of species.

The Kootenai National Forest Land and Resource Management Plan (1987) establishes forest-wide goals, objectives, standards, guidelines, and monitoring requirements. Direction for sensitive species includes determining the status of sensitive species and providing for their environmental needs as necessary to prevent them from becoming endangered (FP II-1). The FP also requires the maintenance of diverse age-classes of vegetation for viable populations of all existing native, vertebrate wildlife species (FP II-1).

Sensitive Species Table 3- 1 Sensitive Wildlife Species on the Kootenai National Forest (Weldon 2011)

Sensitive Species	Status in Analysis Area*	Comments**
Bald Eagle (*Haliaeetus leucocephalus)*	K	Analyzed for this project
Black Backed Woodpecker (*Picoides arcticus*)	K	Analyzed for this project
Coeur d'Alene Salamander (*Plethodon vandykei idahoensis*)	NS	1
Common loon (*Gavia immer*)	NS	1
Fisher (*Martes pinnanti*)	S	Analyzed for this project
Flammulated Owl (*Otus flammeolus*)	K	Analyzed for this project
Harlequin Duck (*Histrionicus histrionicus*)	NS	1
Northern Bog Lemming (*Synaptomys borealis*)	NS	1
Northern Leopard Frog (*Rana pipiens*)	NS	2
Peregrine Falcon (*Falco peregrinus*)	NS	1
Townsend's Big-eared Bat *(Corynorhinus townsendii)*	K	Analyzed for this project
Western Toad (*Bufo boreas*)	K	Analyzed for this project
Wolverine (*Gulo gulo*)	K	Analyzed for this project
Bighorn sheep (*Ovis canadensis*)	NS	1

*Status Key:
K = This species is known to occur within the project area.
S = Species is suspected to occur within project area based on historical records, however recent sightings are scarce primarily due to lack of documentation and formal surveys.
NS = Species is not suspected to occur within the project area, and is dropped from further evaluation.
1 = Suitable habitat does not occur in the analysis area
2 = Only known location on District east of Koocanusa Reservoir.

BALD EAGLE

Data Sources, Methods, Assumptions, Bounds of Analysis

Eagle population ecology, biology, habitat description and relationships identified by research are described in USDI U.S. Fish and Wildlife Service (USDI 1995), USDI 1999, Montana Bald Eagle Working Group (MBEWG) 1991, MBEWG 1994 and USFWS 2007a. That information is incorporated by reference. Eagle occurrence data comes from recent District wildlife observation records, Forest historical data (NRIS Wildlife), and other agencies (USFWS, MFWP).

The National Bald Eagle Management Guidelines (USFWS 2007a) provide the recommendations for avoiding disturbance to bald eagles. Habitat management guidelines from the Montana Bald Eagle Management Plan (MBEMP) (MBEWG 1994 1991) serve as the measure for bald eagle habitat management on the Kootenai National Forest. The effect of any proposed activity on potential eagle habitat and any known eagle nests located within the bald eagle habitat area agreed to by the USFWS (USDI 2001) will be discussed in relation to the National Bald Eagle Management Guidelines (USFWS 2007a) and the MBEMP.

The analysis boundary for project impacts to individuals and their habitat is all lands within the Young Dodge PSU that fall within the bald eagle management zones (Zone 1 = ends ¼ mile from nest site; Zone 2 ends ½ mile from nest site; Zone 3 ends 2.5 miles from nest site) and defined in the 1994 Bald Eagle Management Plan (rev. 2010). The boundary for cumulative effects and making the effects determination is the Young Dodge PSU because it contains more than adequate shoreline for more than one bald eagle territory. The boundary for determining trend and population viability is the Kootenai National Forest.

Affected Environment/Existing Condition

The Bald Eagle was officially removed from the threatened species list on August 8, 2007. It was immediately placed on the Forest Service Northern Region's sensitive species list for a period of five years, after which a status review will be made to determine the need to remain on or be removed from that list.

Bald eagles occur as both seasonal migrants and year-round residents within the boundaries of the Kootenai National Forest. Nesting has increased significantly over the last two decades within the boundaries of the Kootenai National Forest. Only one active nest was known to occur in 1978, whereas 35 nests (18 on NFS and 17 on private land) were known and monitored in 2006. Nest success for active nests over the last twenty-year period is about 83%, with an average of 1.3 fledglings per active nest (KNF bald eagle monitoring records).

Wintering bald eagle numbers have fluctuated over the years depending on food sources (fish from open waters and dead animals along roads and railroad tracks) and winter conditions (open versus frozen water for foraging habitat). Mid-winter bald eagle counts have averaged 96 bald eagles over the past 20 years (KNF bald eagle monitoring records).

About 4813 acres of the bald eagle habitat area (defined as ½ mile from shoreline influenced by water) occur in the Young Dodge PSU. Forest-wide potential bald eagle habitat covers about 564,558 acres (242,965 NFS; 275,470 PVT; and 46,123 water) (based on USDI 2001).

Environmental Consequences

Direct and Indirect Effects

The National Bald Eagle Management Guidelines provide the following recommendations for avoiding disturbance to bald eagles at nest sites:

1) Keeping a distance between the activity and the nest (distance buffers): *there are no known bald eagle nest trees in the Young Dodge PSU.*

2) Maintain forested (or natural areas) between the activity(s) and around nest trees (landscape buffers): *there are no known bald eagle nest trees in the Young Dodge PSU.*

3) Avoid certain activities during the nesting season: *not applicable to this proposal.*

The National Bald Eagle Management Guidelines (NBEMG) provide the following recommendations for avoiding disturbance to bald eagles at foraging areas and communal roost sites:

1) Minimize potentially disruptive activities and development in the eagles' direct flight path between their nest and roost sites and important foraging areas: *not applicable to this proposal because activities greater than ½ mile from a nest site, which is absent in Young Dodge, appear to have little to no effect on bald eagles based on recommended distance buffers (*MBEMP, 1194, rev. 2010) .

2) Locate long-term and permanent water-dependent facilities, such as boat ramps and marinas, away from important eagle foraging areas: *not applicable to this proposal; only a small portion of two bald eagle nest territories (Zone 3) overlap with PSU.; activities greater than ½ mile from a nest site, which is absent in Young Dodge, appear to have little to no effect on bald eagles based on recommended distance buffers (*MBEMP, 1194, rev. 2010) .

3) Avoid recreational and commercial boating and fishing near critical eagle foraging areas during peak feeding times (usually early to mid-morning and late afternoon), except where eagles have demonstrated tolerance to such activity: *not applicable to this proposal as previously stated.*

4) Do not use explosives within ½ mile (or within 1 mile in open areas) of communal roosts when eagles are congregating, without prior coordination with the U.S. Fish and Wildlife Service and MFWP: *not applicable to this proposal.*

5) Locate aircraft corridors no closer than 1000 feet vertical or horizontal distance from communal roost sites: *not applicable to this proposal.*

Additional NBEMG recommendations to benefit bald eagles include:

1) Protect and preserve potential roost and nest sites by retaining mature trees and old growth stands, particularly ½ mile from water: *this recommendation will be applied within primary bald eagle habitat (the expired FWS bald eagle consultation area which included lands ½ mile from major water sources) as applicable and around any known nest or roost sites within the PSU.*

2) Where nests are blown from trees during storms or otherwise destroyed by the elements, continue to protect the site in the absence of the nest for up to three (3) complete breeding seasons: *not applicable to this proposal due to lack of nest site.*

3) To avoid collisions, site wind turbines, communication towers, and high voltage transmission power lines away from nests, foraging areas, and communal roost sites: *not applicable to this proposal.*

4) Employ industry-accepted best management practices to prevent birds from colliding with or being electrocuted by utility lines, towers, and poles. If possible, bury utility lines in important eagle areas: *not applicable to this proposal.*

5) Where bald eagles are likely to nest in human-made structures (e.g. cell phone towers) and such use could impede operation or maintenance of the structures or jeopardize the safety of the eagles, equip the structures with either (a) devices engineered to discourage bald eagles from building a nest, or (b) nesting platforms that will safely accommodate bald eagle nests without interfering with structure performance: *not applicable to this proposal.*

6) Immediately cover carcasses of euthanized animals at landfills to protect eagles from being poisoned: *not applicable to this proposal.*

7) Do not intentionally feed bald eagles. Artificially feeding bald eagles can disrupt their essential behavioral patterns and put them at increased risk from power lines, collision with windows and cars, and other mortality factors: *not applicable to this proposal.*

8) Use pesticides, herbicides, fertilizers, and other chemicals only in accordance with Federal and state laws: *any herbicide treatments concurrent or as mitigation as part of this project will adhere to the 2007 KNF Invasive Plant Management EIS ROD and will also be required to avoid the critical eagle reproduction period of Feb 1st thru June 1(hand spraying allowable after June 1) to allow for chick hatching when adults are less likely to abandon their nest.*

9) Monitor and minimize dispersal of contaminants associated with hazardous waste sites (legal or illegal), permitted releases, and runoff from agricultural areas, especially within watersheds where eagles have shown poor reproduction or where bio-accumulating contaminants have been documented. These factors present a risk of contamination to eagles and their food sources: *not applicable to this proposal.*

MBEMP guidelines identify four general habitat categories and management concerns for bald eagles. They are: nesting habitat, foraging habitat (including perch sites), winter habitat (including roost sites), and mortality risks.

Nesting habitat is typically associated with mature forest stands in close proximity (less than 1 mile) to large bodies of water, including lakes and fourth order streams, which provide an adequate prey base. Nesting habitat includes 3 management zones: I – Nest Site Area, II – Primary Use Area, and III – Home Range. A description of each zone and associated management objectives and guidelines are found in the MPEMP (MBEWG 1994) and are included by reference. *There are no bald eagle nest sites in the PSU; however, very small portions of the home range for two nests extend into the Young Dodge PSU. The nest sites for these home ranges are approximately 2 air miles from Young Dodge PSU and closest proposed activities. Activities greater than ½ mile from a nest site, which is absent in Young Dodge, appear to have little to no effect on bald eagles based on recommended distance buffers (*MBEMP, 1194, rev. 2010) .

Foraging habitat consists of lakes, rivers, wetlands, and meadows that provide open flight paths, perches, and adequate prey. It also includes highway and railroad corridors (especially in the winter) due to dead animals found in these areas.

Winter habitat is generally dictated by the presence and abundance of food, open water, and secure night roost sites (MBEWG 1994). *Eagles are not known to winter within the Young Dodge PSU.*

The MBEMP (1994) identifies bald eagle mortality risks as shooting, accidental trapping, poisoning, diseases, and electrocution. On the Kootenai NF bald eagles have also died from collisions with motor vehicles and trains. *Accidental electrocution due to utility lines, servicing private residences, would represent the highest probability for eagle mortality within the Young Dodge PSU with motor vehicle collision representing the second highest risk for mortality during the winter carrion feeding months.*

Effects Summary

As demonstrated in Sensitive Species Table 3-2, below, all proposed management activities are outside any bald eagle nesting territory with the exception of 304 acres of prescribed burning located within Zone 3 of the Sullivan bald eagle territory and 284 acres of prescribed burning within Zone 3 of the Murray Springs bald eagle territory. The proposed burn areas are nearly two air miles from the nest sites and are not expected to have any impacts on nesting or foraging bald eagles based on recommended distance buffers in the MBEMP (1994; rev. 2010).

There are no communal roost sites present in the PSU.

Effects related to the additional NBEMG recommendations to benefit bald eagles are:

1) Protect and preserve potential roost and nest sites by retaining mature trees and old growth stands, particularly ½ mile from water: This recommendation would be applied within 1/2 mile of open water, as applicable, and around any known nest or roost sites within the PSU; the prescribed burn treatment areas, of Alternatives 1, 1M, and 3 and located within Zone 3 of the Sullivan and Murray Springs eagle nest territories, are not expected to remove large diameter ponderosa pine and Douglas-fir trees that may be available for roosting or nesting. The burns prescribed typically consume the grass and litter layer as well as down woody debris that may have increased since the last burn. These burns may both remove and create large diameter snags as discussed under snag resources.

Sensitive Species Table 3- 2 Summary Of Cumulative Impacts, By Alternative, To Bald Eagle Habitat In The Young Dodge PSU

Alt.	Type of Activity (e.g. Timber harvest)	Acres in Nest Site Area (Zone 1)	Acres in Primary Use Area (Zone 2)	Acres in Home Range Foraging Area (Zone 3)	Other Acres within Identified Bald Eagle Consultation Area
1	Timber harvest	0	0	0	163
	Slashing	0	0	0	869*
	Prescribed burn	0	0	588	2105
	Total Acres	0	0	588	2268
1M	Timber harvest	0	0	0	163
	Slashing	0	0	0	869*
	Prescribed burn	0	0	588	2105
	Total Acres	0	0	588	2268
2	Timber harvest	0	47	208	0
	Slashing	0	0	0	0
	Prescribed burn	0	0	0	0
	Total Acres	0	0	[1308]	0
3	Timber harvest	0	0	0	163
	Slashing	0	0	0	869*
	Prescribed burn	0	0	588	2105
	Total Acres	0	0	588	2268

Alt. = Alternative
Existing habitat within Zone 3 of Sullivan eagle territory is displayed under **Alternative [2]**, the no action alternative. These are NOT impacted acres. *These acres are not exclusive of the associated prescribed burn acres listed.
Timber harvest/slashing/burning would occur on the acres shown for each action alternative
Acres are not cumulative

Alternative 2 would not impact nesting habitat due to lack of action and lack of known nest site. Alternatives 1, 1M, and 3 would not impact nesting habitat (see Sensitive Species Table 3-2). The acres treated and timing of activities would not result in displacing or disturbing nesting eagles. All proposed activities under Alternatives 1, 1M, and 3 are limited to Zone 3, as previously defined, of the Sullivan and Murray Springs bald eagle nest territories, as demonstrated above in Sensitive Species Table 3-2.

Alternative 2 would not impact foraging habitat based on lack of nest(s) site within the PSU and the recommended distance buffers from the MBEMP. Alternatives 1, 1M, and 3 would not impact foraging habitat (see Sensitive Species Table 3-2). Eagles are not likely to be displaced from foraging habitat during project activities based on rationale above.

No alternative would impact bald eagles or its habitat during the winter.

Alternative 2 would not add to bald eagle mortality risk as previously defined. Alternatives 1, 1M, and 3 would not add to the bald eagle mortality risk.

The proposed improvement (relocation) of the Robinson Mountain trail to the old South Fork Young Creek Trail #238 and trailhead parking may impact some trees or snags but would not impact bald eagle habitat as defined due to distance from suitable habitat.

The parking area (approximately one acre), restroom, and road relocation (0.4 miles) associated with the proposed boat ramp may impact individual trees and snags but this localized and limited removal should have minimal impacts on eagles based on the amount of available habitat for this species. These actions are greater than ½ mile from any known bald eagle nest site.

There is no suitable habitat near the Robinson Lookout therefore there would be no impact on bald eagles due to its renovation.

There would be no impacts on bald eagles from the renewal of existing special uses and outfitter and guide permits in the Young Dodge PSU because the habitat disturbance from these actions has already been accounted for in the existing condition. Likewise, any bald eagles that may utilize these areas would have already adjusted (i.e. relocated, tolerate use level) from existing sources of human disturbance much similar those suggested in the MBEMP (1994, rev.2010)

Cumulative Effects

Summary of the Existing Condition

Past management actions occurring since the initial operation of Libby Dam in 1972 are not believed to have measurably contributed to cumulative impacts on bald eagles or their habitat. The higher quality bald eagle habitat was covered with the creation of Koocanusa Reservoir. Likewise, with the development of the Forest Plan, management activities have been largely restricted along the reservoir outside of established recreation areas. Additionally, wildfire suppression near the reservoir has contributed to protecting large diameter trees suitable for perching, roosting, and nesting. It is likely that windstorms have had, and will continue to have, the greatest impact on suitable bald eagle habitat on the Rexford Ranger District and along the entire Koocanusa Reservoir system.

Effects of Current and Reasonably Foreseeable Actions

The Cumulative Effects Worksheet, located in the Wildlife section of the Project File, contains the detailed analysis of all past, current, and reasonably foreseeable activities listed in Tables 3-1 and 3-2. All activities identified to occur within the Analysis Area that have the potential to affect the bald eagle are discussed below.

Vegetation Management and Fuels Reduction Activities

The Dodge Mountain Pine Beetle thinning unit (255 acres) is planned for 2012 at the southernmost boundary of the Young Dodge PSU. This timber stand improvement project is not within any type of mature forest stand, however it is adjacent to one block of undesignated replacement old growth and one block of undesignated effective old growth. This unit would not result in cumulative edge effects to any old growth due to its prescription therefore having minimal impacts on any bald eagle nesting/roosting possibly utilizing the area old growth. There is one eagle nest near these areas at the mouth of Sullivan Creek and these treatment acres have been accounted for in Sensitive Species Table 3-2.

The action alternatives, in combination with other current and reasonably foreseeable actions including tree planting, precommercial thinning, Christmas tree cutting, boughs, pine cone collecting, and blowdown salvaging (see Table 3-2) would maintain suitable bald eagle habitat by avoidance. Other than possibly annoying individual birds, human disturbance from these activities would have minimal impacts on area bald eagles especially in concert with recommended timing restrictions from the MBEMP.

Livestock Grazing

Cattle grazing would not result in a change of mature forested habitats that provides nesting areas for this species, as it does not involve the harvest of trees, dead or alive. Additionally, changes to the grass/herbaceous layer of vegetation would not affect eagle habitat characteristics and generally, due to the lack of ungulate forage in mature forest stands,cattle grazing is typically not an issue.

Noxious Weed Treatment

Weed treatment activities, implemented according to the *2007 KNF Invasive Plant Management EIS ROD* would not lead to any adverse effects on bald eagles or their habitat because treatment of weeds would actually benefit forage species important to many species or their prey (USDA Forest Service 1997, 30). No loss or change in specific habitats (e.g. old growth, mature forests, lakes, wetlands) inhabited by prey species would result from this activity because weed treatments primarily focus on the herbaceous layer along roads and in disturbed areas.

Fire Suppression

With the direction to suppress all wildland fires on NFS lands, construction of firelines, safety zones, and other control structures could impact individuals on a site-specific basis. Avoidance of known eagle nests would be attempted during suppression efforts but some impacts may still occur. Due to the unpredictable nature of wildfires, contributions of fire suppression to the cumulative effect on this species can only be surmised but could include loss of actual nest tree (nest failure), loss of forested habitat around wetlands or lakes, avoidance of habitat by eagles due to heavy smoke or suppression activities.

Road Management Activities

Although road restoration and maintenance projects (brushing, blading, gate repairs, culvert replacement etc.) may temporarily displace eagles from a localized area or impact individuals, they typically benefit the species in the long-term, especially if the projects involve closing previously open road systems (refer to road decommissioning in Transportation/Water Sections.

Recreation Maintenance

Normal road and trail maintenance activities have the potential to remove nesting and foraging trees for eagles if they are close to a trail or road in suitable habitat, as defined, and present a safety hazard. This situation is extremely rare and often mitigated via distance buffers. Effects could include removing site-specific, individual trees, and would not be expected to contribute measurably to the cumulative effect on the bald eagle under consultation with a biologist.

Routine maintenance of dispersed recreation sites would not contribute to the cumulative impact on bald eagles because maintenance of these facilities do not typically involve removal of habitat elements such as large trees or snags unless deemed to be a safety hazard to forest users. In this situation, the removal of a tree or snag is considered negligible. In the situation where nest trees need to be removed due to safety concerns, removal would occur upon conclusion of the reproduction period.

Special Uses

Operations of outfitter/guides would not result in any change to general and specialized eagle habitats (e.g. mature forests, wetlands, lakes), as they do not involve the harvest of trees. There would be no cumulative effects to eagles or their habitats associated with these activities other than possible temporary and local avoidance of an area due to the presence of humans.

Permits associated with access to private homes, rights-of-way for utilities, and outfitter/guides are not expected to contribute cumulatively to the impact on eagles because they are limited to previously disturbed and hardened sites like trails and roads. There are no known land exchanges planned within the PSU at this time. For a discussion of existing private lands, please see below.

Public Use

Other forest product activities occurring presently and typically on an annual basis are the gathering of pine cones, boughs and commercial gathering of Christmas trees. These activities occur throughout the PSU, and have little-to-no effect on the landscape due to the unspecific nature of the use and the low impact on the resources (foot traffic, hand tools). Additionally, Christmas trees are harvested from existing regeneration units, so this activity would have no cumulative effect on the specialized habitats of eagles, such as mature trees and riparian areas. During the reproduction period, adult eagles may become agitated if humans partaking in activities mentioned above become too close to active bald eagle nests. Typically, public use, outside of those water related, are outside of the more sensitive distance buffers recommended by the MBEMP.

Private Property

If private land owners build their estimated 12.5 miles of road and harvest an estimated 25 acres based on 5 homesites, there would likely be a decrease in dry-site old growth within the PSU, but outside of NFS lands. Any cumulative effects to eagles will be partially dependent on the duration (seasonal versus year-round) of use of these parcels and homes and their proximity to known bald eagle nest territories. Anticipated effects include species displacement, nest failure, habitat alteration and/or habitat loss.

Other Lands

The state of Montana is proposing to thin 50 acres immediately adjacent to existing old growth blocks in T37N, R28W. This activity should have beneficial effects on neighboring old growth and mature stands in that the thinning may prevent mature stand loss, and therefore potential eagle habitat, due to any wildfire initiating on these State lands. Being that these lands would only be thinned and not regenerated, there should be little cumulative edge effect to neighboring NFS old growth blocks as potential eagle habitat. The disturbance associated with this activity may cause eagles to avoid the area during implementation. Additionally, these lands are greater than ½ mile from any major water source including Koocanusa Reservoir and would be considered marginal habitat.

Summary of Cumulative Effects

Project scheduling/staging may be required in order to avoid possible cumulative effects from various vegetation management and fuel reduction activities occurring within and adjacent to the PSU relative to eagle disturbance and recommendations from the MBEMP.

The temporal occurrence of forest uses such as summer activities (camping, hiking, and berry picking) versus fall (hunting and firewood cutting) or winter (skiing and snowmobiling) activities, and the scheduling of management actions to avoid key time periods (spring calving and nesting) when wildlife may be more sensitive to human disturbances, allow for the avoidance of measurable cumulative impacts to wildlife. There may be some situations where isolated or localized cumulative effects may occur, due to an overlap of forest activities, but these situations are typically short in duration, and do not persist through the lifecycle of any one species, either temporally or spatially.

Regulatory Consistency

- All Alternatives meet Forest Plan direction for sensitive species (FP Vol. 1, II-1 #6) by maintaining appropriate amounts and quality of suitable habitat in order to maintain species viability.
- The project is consistent with the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668C 1978) by avoiding disturbance or resulting in take of bald eagles by avoiding the nesting season of any known bald eagle territory.

- The project is consistent with the Migratory Bird Treaty Act (17 U.S.C. 703-712) by avoiding the nesting season when eggs or chicks could be impacted and by protecting the nest site from management activities.

Statement of Findings

Alternatives 1, 1M, 2, and 3 will have <u>no impact on individuals or their habitat and will not contribute to a trend toward federal listing or loss of species viability for the bald eagle</u>. This determination is based on: 1) the lack of activities within Zones 1 or 2 of any known bald eagle territory; 2) only 588 acres of prescribed burning is proposed within Zone 3 of two bald eagle territories and this activity is not expected to impact bald eagle foraging nor the nesting or roosting capabilities of the habitat based on recommended distance buffers from the MBEMP; 3) the distance between the closest known bald eagle nest (approximately 2 air miles) and the proposed prescribed burn treatment areas; and 4) adherence to the National Bald Eagle Management Guidelines.

BLACK-BACKED WOODPECKER

Data Sources, Methods, Assumptions, Bounds of Analysis

Black-backed woodpecker (BBW) population ecology, biology, habitat description and relationships identified by research are described in Powell (2000), Cherry (1997), Hutto (1995), and O'Connor and Hillis (2001). That information is incorporated by reference. Black-backed occurrence data comes from recent District wildlife observation records and Forest historical data (NRIS Wildlife). Black-backed woodpecker habitat was modeled using TSMRS / FACTS vegetation data and running the Kootenai TSMRS BBW habitat model (KNF Wildlife Model 2007). The potential population index (PPI) (number of potential territories) was calculated for a breeding pair by dividing general forest habitat acres by 800 acres (approximate largest home range) and by dividing high quality habitat acres by 175 acres (approximate smallest home range; Johnson et al 2004 Appendix G). The difference in territory size used in the two habitat components is based on the assumption that higher quality habitat can support a breeding pair with fewer acres. High quality habitat is defined as recent (≤ 5 years old) mixed-lethal or stand-replacement fire areas where an abundance of snags are available. Black-backed woodpeckers have been found to be almost restricted to early post-fire forests (Hutto 1995). Territory sizes are from the summary paper by Cherry (1997). The analysis boundary for project impacts and cumulative effects to individuals and their habitat is the Young Dodge PSU. The boundary for determining trend or viability is the Kootenai National Forest.

Affected Environment/Existing Condition

Habitat for black-backed woodpeckers consists of boreal and montane forests where beetle outbreaks are occurring as a result of disturbances caused by fire, wind, and disease. In the PSU black-backed woodpecker habitat consists mainly of lower quality effective old growth habitat with small scattered patches of snags produced by insect and disease. This lower quality habitat supports low populations of resident BBWs. The Kootenai TSMRS / FACTS BBW habitat model (KNF Wildlife Model 2007) identified 3094 acres of lower quality habitat (categorized as unburned effective old growth, designated and undesignated, as well as recent areas of insect infestations). High quality habitat in the form of recent (in the last 5 years) mixed lethal and stand-replacing wildfire or prescribed fire is absent in the PSU. The available low quality and high quality habitat combined would produce a PPI of three to possibly four pairs.

As a primary cavity-nester, BBWs require dead or live trees with heartwood rot and show a preference for Douglas-fir, ponderosa pine, lodgepole pine, and western larch. According to Thomas (1979 p.74), a snag level of 40 percent or more should maintain viable populations of birds dependent on cavities for nest sites. The existing snag habitat level for the PSU is conservatively estimated at 45.9%.

On a Forest-wide level, modeled BBW habitat is abundant, broadly distributed and amounts to 200,094 acres of lower quality habitat (unburned effective old growth habitat; 2007 Forest Plan Monitoring Report). Black-backed woodpeckers are known to the general area, and throughout the Rexford Ranger District, based on past documented observances dating back to 1992. Most recent (past 4 years) sightings of the BBW occurred in the Camp 32 Wildfire area of 2005, which is outside the PSU. This species naturally occurs in very low numbers in the absence of recent wildfires and is easily confused with the more common northern three-toed woodpecker of similar size and coloration. These conditions make it more difficult for average birders and forest workers to identify and document this species with high certainty.

Environmental Consequences

Proposed activities for Alternatives 1, 1M, and 3 have the potential to remove or reduce low quality habitat foraging opportunities, and at the same time, create foraging habitat during post-harvest burning activities. Regeneration harvest would remove general opportunities, leaving a minimum number of wildlife trees available for foraging. Regeneration harvest almost always includes underburning, and with heavier slash, has potential to kill trees left on site. Overall, a larger amount of low-quality habitat would be replaced with a smaller amount of higher-quality habitat. Commercial thinning would leave a number of trees on site for general foraging opportunities. Underburning in these stands would create more potential for BBW foraging habitat than regeneration harvest. Commercial thinning with underburning and stands with underburning-only would be most similar to historical conditions created by mixed-severity fires, and could provide high-quality BBW for 2-3 years, then declining and rarely providing insect food sources beyond 5-7 years (Caton 1996; Murphy and Lehnhausen 1998).

Sensitive Species Table 3- 3 Cumulative Changes in Black-backed Woodpecker Habitat and PPI by Alternative

Habitat Change in Acres (% Change)	Existing Alt 2 (No Action)	Alternative 1	Alternative 1M	Alternative 3
Number of acres treated that may result in isolated patches of high-quality habitat due to underburning and/or thinning	0	5965**	6658**	5278**
Change in Lower-Quality Habitat (old growth; insect infested areas)	n/a	0	0	0
Change in High-Quality Habitat (recent burn areas)	n/a	n/a	n/a	n/a
PPI – Pair Territories in Project Area	3	3	3	3
Reduction in Lower-Quality Habitat Forest-wide	200,094*	0	0	0
PPI – Pair Territories Forest-wide	250	250	250	250

*Only includes Forest-wide old growth acres; insect and disease area were not mapped for the PSU; this is the existing condition. **Add these acres to the existing condition for a short-term (<5 years) cumulative effect for available habitat.

Direct and Indirect Effects

Alternative 2 (No Action)

Alternative 2 would maintain and allow the natural insect and disease processes to occur. Effective old growth stands would continue to provide low quality foraging. The potential for stand-replacing fires escaping initial attack would continue to increase as fuel levels increased. If a wildfire were to occur, prime BBW habitat would be created, and conditions would benefit this species. Local populations would experience an immediate increase as bark beetles increased, lasting three to five years, until beetle populations declined.

Alternatives 1, 1M, and 3

Alternatives 1, 1M, and 3 would create forest openings with regeneration harvest on 1912, 960, and 1618 acres in the PSU, respectively. The action alternatives would also commercially thin 742, 630, acres and 864 acres, respectively. Alternative 1M would also treat 390 acres with a free selection method and 135 acres with mosaic harvest. While these activities reduce and/or alter the amount of mature forest available for general woodpecker use (low-level of foraging) they would also create some good forage trees following underburning, especially in the commercially thinned areas. Habitat reductions in high-quality habitat (recent burned areas) or low-quality habitat (effective old growth areas) would not result following implementation of any of these alternatives. A minimum of approximately 12% or 3094 acres of lower-quality habitat would remain following implementation of all action alternatives. There are currently no areas of recently burned stands within the PSU to qualify as high-quality habitat. Additionally, all action alternatives proposed to prescribe burn anywhere from 2796 (Alternative 3) to 3850 (Alternative 1M) or 4005 (Alternative 1) acres that may create isolated, small pockets of high quality BBW habitat in the PSU. On a Forest-wide level, there would be no reduction in the quantity of either lower-quality or high-quality BBW habitat as previously defined. No effects on distribution of habitat needed for viable populations of BBWs in the PSU or the Forest would occur. In addition, the thinning and underburning treatments may provide additional foraging trees if tree stress or mortality occurs during or following the prescribed burns. There would be no change in the PPI for either the PSU or Forest as a result of the action alternatives based on modeled habitat.

The proposed improvement (relocation) of the Robinson Mountain trail to the old South Fork Young Creek Trail #238 may impact some trees or snags contributing to an MA13 block, but since the old trail prism would be utilized, this impact would be minimal. The potential for tree or snag loss at the trailhead along the open road #7205 has already been accounted for in the effects of road systems on snag capability in that any areas 100 feet from any road are considered to have a zero capability to produce snags. These recreation based activities are expected to have negligible impacts on any BBW habitat in these areas due to their scope. The parking location is not adjacent to any mapped old growth that may serve as low-quality BBW habitat.

The parking area (approximately one acre), restroom, and road relocation (0.4 miles) associated with the proposed boat ramp would have no impact on old growth because there is no old growth designated (mapped) for that particular area. Likewise, there is no old growth area near the Robinson Lookout therefore there would be no impact on old growth due to its renovation. Therefore neither of these activities would impact any mapped old growth that may serve as low-quality BBW habitat.

There would be no impacts on the old growth resource (low quality BBW habitat) from the renewal of existing special uses and outfitter and guide permits in the Young Dodge PSU because the disturbance from these actions has already been accounted for in the existing condition or they are outside of any old growth area.

Cumulative Effects

Summary of the Existing Condition

Past and present actions, including wildfire suppression, have resulted in measurable cumulative impacts to BBWs and their habitat. These impacts have largely been in the form of either removal of prime nesting/foraging habitat via fire salvage, harvesting of old growth forest considered low-quality habitat, or unintentionally affecting potential habitat via wildfire suppression. New strategies related to wildfire salvage as well as old growth protection will assist in perpetuating this species into the future.

The existing situation provides habitat for three BBW territories based on the availability of lower-quality habitat of adequate size and even distribution. There are no recent burned areas to provide high-quality habitat however, snag habitat, which is above the minimum needed of 40%, will assist in perpetuating the species through time until new areas of wildfire occur on the landscape. The existing habitat for BBWs consists only of lower quality effective old growth. Please refer to the Old Growth resource section for further discussion of possible cumulative effects on BBWs.

Effects of Current and Reasonably Foreseeable Actions

The Cumulative Effects Worksheet, located in the Wildlife section of the Project File, contains the detailed analysis of all past, current, and reasonably foreseeable activities listed in Tables 3-1 and -2 (pp III-2-4). All activities identified to occur within the Analysis Area that have the potential to affect the black-backed woodpecker are discussed below.

Vegetation Management and Fuels Reduction Activities

The Dodge Mountain Pine Beetle thinning unit (93 acres) is planned for 2012 at the southernmost boundary of the Young Dodge PSU. This timber stand improvement project is not within any type of old growth, however it is adjacent to one block of undesignated replacement old growth and one block of undesignated effective old growth. This unit would not result in cumulative edge effects to any old growth due to its prescription and therefore not affect the old growth's suitability as low-quality BBW habitat.

Cumulatively, the proposed activities (timber harvest, prescribed fire, ground fuel reduction) in designated and undesignated old growth would not reduce the amount and distribution of old growth below Forest Plan requirements. However, due to the use of fire following fuel treatments and the use of prescribed burns, localized pockets of high quality BBW habitat may be produced to help support resident pairs of BBWs.

Livestock Grazing

Cattle grazing would not result in a change of old growth habitat, snags or down woody debris in the PSU, as it does not involve the harvest of trees, dead or alive and therefore would not affect the suitability of old growth stands to serve as low-quality BBW habitat. Grazing cattle predominantly move along road systems and within past harvest units where an abundance of forage can be found.

Noxious Weed Treatment

Noxious weed management would result in no loss or change in BBW habitat in the form of old growth because weed treatments primarily focus on the herbaceous layer along roads and in previously disturbed areas.

Fire Suppression

In the event of a wildfire, construction of fire lines, helispots, and safety zones could potentially result in impacts to old growth habitat serving as low-quality BBW habitat. Conversely, wildfire suppression also serves to preserve existing old growth habitat but also directly reduces production of potential habitat created by wildfires.

Road Management Activities

Road management actions such as road maintenance and administrative use associated with permit administration, data collection, and monitoring of NFS lands are not likely to affect old growth and its suitability as BBW habitat, because they generally do not result in vegetation removal. The standing tree and snag component would only be affected if considered a hazard to road users. These activities would not result in any change to the quantity of old growth, thus no adverse cumulative effects would be expected.

Recreation Maintenance

Routine maintenance of trails and developed and dispersed recreation sites would not contribute to the cumulative impact on old growth because maintenance of these facilities do not typically involve removal of old growth elements such as large trees or snags unless deemed to be a safety hazard to forest users. In this situation, the removal of a tree or snag is considered negligible and would not affect old growth suitability as BBW habitat.

Special Uses

There are areas previously impacted by special use permits such as gravel pits, building sites (fire station), fish weir, utility corridors, private land access routes, and outfitter/guide trails that will continue to be present and utilized. Maintenance of these facilities may result in removal or individual trees or snags periodically, however they would not measurably affect the suitability of surrounding forest stands to serve as low-quality BBW habitat.

Public Use

Firewood gathering would continue to remove some snags from old growth along open road corridors and these acres were previously accounted for as part of the existing condition. Other forest use activities such as mushroom and berry picking, camping, hunting, Christmas tree cutting, bough collection, etc have little to no measurable impact on old growth because they are largely non-consumptive or rapidly re-established and would not contribute to the cumulative effect on this resource or its ability to serve as low-quality BBW habitat.

Private Property

If private land owners build their estimated 12.5 miles of road and harvest an estimated 25 acres based on 5 homesites, there would likely be a decrease in dry-site old growth within the PSU, but outside of NFS lands. Unless these lands were consumed in wildfire(s) or suffered insect infestation(s) prior to becoming harvested, there would be negligible impacts on any resident BBWs.

Other Lands

The state of Montana is proposing to thin 50 acres immediately adjacent to existing old growth blocks in T37N, R28W. This activity should have beneficial effects on neighboring old growth in that the thinning may prevent old growth loss due to any wildfire initiating on these State lands. Being that these lands would only be thinned and not regenerated, there should be little cumulative edge effect to neighboring

NFS old growth blocks. Therefore, state activities are expected to have little impact on any suitable BBW habitat found within adjacent old growth.

Summary of Cumulative Effects

As previously stated, fire suppression over the last century has altered stands historically maintained by fire disturbance and had a net reduction in quality BBW habitat. The affected stands have developed fuel loading and ladder fuels that are uncharacteristic for some sites. These conditions would continue to develop until a natural disturbance occurs.

Potential natural disturbances (wildfire, insect or disease epidemics, wind) could reduce old growth characteristics or completely remove an area of old growth under extreme conditions. Likewise, there is the potential for human caused fires initiating on private lands to move on to adjacent NFS lands and remove old growth that has not been, at least partially, managed either by prescribed burning and/or removal of ladder fuels. Conversely, these same disturbances would create high-quality BBW habitat resulting in beneficial impacts to the species or at least 3 to 5 years.

The most recent Forest-wide old growth analysis concludes that at least 10% of the KNF below 5500 feet elevation is designated for old growth management. The proposed activities would not affect the 10% standard for old growth at either the PSU or Forest scale and therefore have no impact on low-quality BBW habitat.

Regulatory Consistency

Forest Plan

All alternatives are consistent with Forest Plan direction to maintain a minimum of 10% old growth below 5500 feet in elevation in each third order drainage or compartment, or a combination of compartments (Kootenai Supplement No 85; supplement to FSM 2432.22).

Based on April 26th, 2004 direction (Castaneda 2004), old growth will be analyzed at the PSU scale. After implementation of the action alternatives, the Young Dodge PSU would have 10.3% designated old growth below 5500 feet elevation. In addition, 1147 acres of undesignated old growth would remain. The most recent Forest-wide assessment as documented in the Forest Plan Monitoring and Evaluation Report (USDA Forest Service 2007) shows that the Kootenai National Forest has 11.6% old growth designated (includes both effective and replacement). The Kootenai Forest Plan established that maintaining 10% of old growth habitat is sufficient to support viable populations of old-growth dependent species (Vol 1 II-1 7; III-54; Vol 2 A17).

MA 13 Recreation Standards: All alternatives comply with these standards. A forest closure order exists to off-highway vehicles that, restricts them to established roads and trails therefore limiting their effect on old growth.

MA 13 Wildlife and Fish Standards: All alternatives comply with these standards, which are largely passive and favor natural processes. Also refer to grizzly bear analysis.

MA 13 Range Standards: All alternatives comply. Due to the lack of available forage in old growth stands, use by grazing cattle is negligible.

MA 13 Timber standards: All alternatives comply with Standards 1 and 3. Unauthorized firewood cutting could impact snags located in old growth habitat, and this effect is taken into consideration in the cavity habitat analysis and accounted for under the existing condition.

MA 13 Facilities standards: All alternatives comply with Standards 2 and 3. All alternatives would continue to restrict motorized access on local roads where closures exist.

MA 13 Fire Standards: Planned ignitions. The proposed slashing and burning is consistent for all alternatives. The Forest Plan (Vol 1 III-56) states that planned ignitions are acceptable to maintain old growth characteristics (e.g. old growth ponderosa pine).

National Forest Management Act

The project complies with the National Forest System Land and Resource Management Planning rule of November 9, 2000, as amended by meeting Kootenai National Forest Land Management Plan direction for old growth and through the utilization of best science for potential impacts on old growth habitat and its associated species.

Statement of Findings

Alternatives 1, 1M, 2, and 3 will have no impact to individuals or their habitat and will not contribute to a trend toward federal listing or loss of species viability for the black-backed woodpecker. This determination is based on the fact that: 1) the project does not involve the removal of high-quality or lower-quality habitat as previously defined; 2) the current and foreseeable snag level is maintained above the 40% viability threshold as described by Thomas (1979); 3) the project meets FP standards and guidelines for this species; and 4) associated prescribed burn activities may produce small isolated pockets of high quality habitat for this species.

FISHER

Data Sources, Methods, Assumptions, Bounds of Analysis

Fisher population ecology, biology, habitat description and relationships identified by research are described in Powell and Zielinski (1994) and Heinemeyer and Jones (1994). That information is incorporated by reference. Fisher occurrence data comes from recent District wildlife observation records and Forest historical data (NRIS Wildlife) and other agencies (MFWP). Fisher habitat was modeled based on habitat parameters from cited literature (see Fisher Habitat Model Process Paper; Project File) using TSMRS vegetation data. The potential population index (PPI) (habitat acres divided by average home range acres) was calculated using 10,000 acres as the average male and 3700 acres as the average female fisher home ranges (Powell and Zielinski 1994). The index shows both male and female fisher because their home ranges overlap extensively (Ibid). The boundary for cumulative effects is the PSU because the size of the PSU is much larger than the average home range of the fisher. The boundary for determining trend or viability is the Kootenai National Forest because of the association of fisher with riparian habitats which can naturally limit (i.e. available habitat versus home range size) fisher densities.

Affected Environment/Existing Condition

Johnson (1999) shows fisher presence confirmed in five of the eight planning units on the Kootenai, and the Young Dodge PSU, located in the Koocanusa planning unit, is not an area of confirmed presence. However, fisher observation and monitoring data indicates that one fisher mortality was recorded (2000) on lands managed by the State of Montana within the PSU, so its status remains uncertain. It is likely that the fisher was a transient from Canada based on the occurrence of a re-introduction project out of Cranbrook, British Columbia in 1995. There is a mapped fisher sighting from 1997 approximately 8 air miles south of the PSU from an unknown source and in 2007, an employee of the Rexford R.D. reported a possible fisher sighting approximately 13 air miles south of Young Dodge in the Big Creek drainage. However the validity of this sighting is questionable due to the experience of the employee. Another sighting (Sheep Creek, 1983), also in the Koocanusa planning unit, was about 21 air miles from the PSU but is nearly 30 years dated, so its status remains uncertain in the Koocanusa planning unit. This fisher may have been genetically linked to those transplanted in Pink Creek in 1959 (Vinkey 2003), however this is purely speculative as most of these individuals are thought to have migrated east to the Whitefish Range.

Population Information and Potential Habitat

According to Vinkey (2003), there is little known of fisher beyond 1989 for the Purcell Mountains with few verified records. Other than those sightings listed above in the adjacent areas, there are no additional fisher sightings that may hint fisher use of the Young Dodge PSU. Likewise, there are no State trapping records for fisher in Lincoln County (Trapping District 1) since 2003 when five fisher were harvested within the county (www.fwp.mt.gov). It is uncertain whether this lack of information is due to fewer trappers or fisher distribution or both. Vinkey speculated that the more recently established populations pulsing from transplant efforts may have “vanished due to habitat alterations, direct mortality, random demographic and environmental events, or a combination of these factors.” Regardless of the cause, there is no recent information on fisher in the Young Dodge PSU to suggest nothing other than transient use of any habitat that may be available and suitable. Additionally, the fisher spends much of its time within thick, riparian habitats where human access and use is limited due to ruggedness. For this reason, fisher go largely undetected from humans by avoidance. Therefore potential habitat has been modeled assuming fisher may be present as a transient species and each alternative will be analyzed for its impact on potential habitat.

Reudiger (1994) shows the Kootenai National Forest as a primary habitat area for fisher. Modeling fisher habitat identifies 3732 acres of potential summer habitat and 5541 acres of potential winter habitat in the Young Dodge PSU. Following the identification process outlined in Reudiger (Ibid), the Koocanusa planning unit (major drainage) is assigned as a secondary fisher conservation area (Johnson 2004a). The Young Dodge PSU (sub-drainage) was determined to be moderate quality fisher habitat area (Ibid).

Based on the average male and female fisher home range sizes and the modeled habitat acres, the potential population index for the Young Dodge PSU is possibly one female and one male fisher. Using the yearlong (modeled) habitat acres from Johnson (1999), the minimum PPI for the Kootenai National Forest would be 29 male and 80 female fisher.

Environmental Consequences

Sensitive Species Table 3-4 summarizes the cumulative changes in habitat acres and PPI due to each alternative.

Sensitive Species Table 3- 4 Habitat and PPI Changes by Alternative

	Alternative 2 (No Action) (Existing Condition)	Alternative 1	Alternative 1M	Alternative 3
Habitat Acres - Planning sub-unit (% decrease)	3732 summer 5541 winter	-8% -9%	-6% -7%	-8% -9%
PPI - Project Area (Males/Females)	1 / 1*	1 / 1*	1 / 1*	1 / 1*
Habitat Acres - Forest-wide (% change)	294,531 acres	294,031 acres	294,159 acres	294,029 acres
PPI - Forest-wide (Males/Females)	29 / 80	29 / 80**	29 / 80**	29 / 80**

*Adequate amount of suitable habitat may not be present under the existing condition or under any action alternative. Live fisher have not been recently documented (last 5 years) in the associated Koocanusa fisher planning unit.
**Due to the limited amount of habitat present under the existing condition and the effect of the action alternatives, the effect on PPI for this species within the PSU and Forest is difficult to quantify.

Direct and Indirect Effects

Alternative 2 (No Action) would have no direct or indirect effects on fisher habitat within the PSU due to lack of action.

Each of the action alternatives propose vegetation management activities that would reduce the amount of fisher habitat in the Young Dodge PSU (see Sensitive Species Table 3-4 for acres by Alternative). Alternative 3 would adjust proposed treatment units to avoid modeled fisher habitat. While Alternatives 1 and 1M would alter modeled potential habitat, they would still adhere to FP direction for vegetation treatments in riparian zones and follow state SMZ regulations. The treatments as disclosed in Table 3-4, above, may alter or remove habitat for prey species of the fisher, locally affect the way fisher move through the habitat, remove denning habitat in the form of down and hollow logs, as well as remove resting habitat in the form of large, mature trees and again, down hollow logs. However, given the scattered nature of the proposed treatment units and the adherence to SMZ laws and regulations, Alternatives 1, 1M, and 3 are not expected to prevent the movement of any transient fisher that may utilize the PSU. In that respect, the project is not expected to contribute to any perceived or documented downward trend in population by limiting their movement via habitat fragmentation.

While research does not show fisher to be highly sensitive to human activity, the presence of people and machines during project implementation may still displace fisher using the suitable habitat in or near the proposed units. The displacement would last until the machines are turned off or leave the area and the people are gone. Heinemeyer and Jones (1994) show the most sensitive time for fisher is the breeding, denning and rearing period (Feb. 15-June 30). Impacts within 200 meters of perennial streams are especially important to avoid (Ibid). The project design, for Alternatives 1, 1M, and 3, include timing constraints that only allow activities from July 1 to February 15 on all units in this zone if fisher are confirmed in the PSU. This measure should reduce displacement impacts during the most sensitive time for fisher.

The proposed improvement (relocation) of the Robinson Mountain trail to the old South Fork Young Creek Trail #238 may impact some trees or snags contributing to potential fisher habitat, but since the old trail prism would be utilized, this impact would be minimal. The potential for tree or snag loss at the trailhead along the open road #7205 has already been accounted for in the affects of road systems on snag capability in that any areas 100 feet from any road are considered to have a zero capability to produce snags. The parking location is not adjacent to any mapped old growth that may provide for fisher movement and foraging.

The parking area (approximately one acre), restroom, and road relocation (0.4 miles) associated with the proposed boat ramp would have no impact on fisher because there is no suitable fisher habitat present in that particular area. Likewise, there is no forested riparian habitat near the Robinson Lookout therefore there would be no impact on fisher due to its renovation.

There would be no impacts on fisher habitat from the renewal of existing special uses, including access permits, and outfitter and guide permits in the Young Dodge PSU because the disturbance from these actions has already been accounted for in the existing condition or they are outside of potential fisher habitat. Conversely, the action alternatives would result in additional road storage or decommissioning that would benefit fisher by reducing human access in the PSU.

Cumulative Effects

Summary of the Existing Condition

Timber harvests, salvage of blowdown, road construction, and wildfire occurrences, especially those occurring within the past 75 to 100 years, are those activities responsible for most of the reduction of suitable fisher habitat. These occurrences, whether man-caused or natural have altered numerous acres of mature and late succession forest stands and their associated elements, including large woody debris. This statement is especially true when these types of stand alterations occur within 200 to 400 meters of riparian areas known to provide habitat for many of the fisher's prey species. Forest Plan direction and other laws/regulations applicable to forest management in or near streams, as well as wildfire suppression, now assist in protecting fisher habitat for perpetuation of this species.

Effects of Current and Reasonably Foreseeable Actions

The Cumulative Effects Worksheet, located in the Wildlife section of the Project File, contains the detailed analysis of all past, current, and reasonably foreseeable activities listed in Tables 3-1 and 3-2 (pp III-2-4). All activities identified to occur within the Analysis Area that have the potential to affect the fisher are discussed below.

Vegetation Management and Fuels Reduction Activities

The Dodge Mountain Pine Beetle thinning unit (93 acres) is planned for 2012 at the southernmost boundary of the Young Dodge PSU. This timber stand improvement project is not within any type of old growth or riparian habitat, however it is adjacent to one block of undesignated replacement old growth and one block of undesignated effective old growth. This unit would not result in cumulative edge effects to any old growth due to its limited prescription. Likewise, this treatment unit is not expected to impede the use of a nearby stream course due to avoidance and its limited scope.

Cumulatively, the proposed activities (timber harvest, prescribed fire, ground fuel reduction) in designated and undesignated old growth would not reduce the amount and distribution of old growth, which may serve as fisher habitat, below Forest Plan requirements. However, due to cumulative edge effects (see Old Growth Table 3-4 above) there may be reduced old growth quality for some plant and animal species like fisher, such as resulting in less interior habitat and more edge where predation is more likely to occur or where noxious weed invasions are more likely to become established. However, given the level of impact and the quantity of old growth in the PSU, this effect should be minimal and would diminish in approximately 50 years (Russell and Jones 2001; Ripple et al 1991; Russell et al 2000).

Private lands in the Young Dodge PSU were assumed to not provide any old growth, based on past harvest practices.

The action alternatives, in combination with other current and reasonably foreseeable actions including tree planting, precommercial thinning, Christmas tree cutting, boughs, pine cone collecting, and blowdown salvaging (see Table 3-2) would maintain the designated management level of old growth by avoidance. In the instance where existing old growth is burned or blown down, replacement old growth will be designated to account for this loss with emphasis in riparian ecosystems which serve well as movement corridors for many species including the fisher.

Livestock Grazing

Cattle grazing would not result in a change of old growth habitat and riparian ecosytems, snags or down woody debris in the PSU, as it does not involve the harvest of trees, dead or alive. Grazing cattle predominantly move along road systems and within past harvest units where an abundance of forage for livestock can be found.

Noxious Weed Treatment

Noxious weed management would result in no loss or change in fisher habitat, as defined, because weed treatments primarily focus on the herbaceous layer along roads and in previously disturbed areas. Riparian ecosystems are considered to be more sensitive to herbicides and are largely avoided by noxious weed treatments.

Fire Suppression

In the event of a wildfire, construction of fire lines, helispots, and safety zones could potentially result in impacts to old growth habitats, including riparian environments. Conversely, wildfire suppression also serves to preserve existing old growth and riparian areas serving as fisher habitat. Suppression activities are typically subject to input from District Resource Advisors, and protection of special habitats, including old growth, is considered. However, if cumulative effects to old growth habitat result in the habitat no longer functioning as old growth, additional old growth habitat would be designated.

Road Management Activities

Road management actions such as road maintenance and administrative use associated with permit administration, data collection, and monitoring of NFS lands are not likely to affect old growth and other specialized habitats (e.g. snags, down woody debris) , that may be utilized by fisher, because they generally do not result in vegetation removal. The standing tree and snag component would only be affected if considered a hazard to road users. These activities would not result in any change to the quantity of old growth, thus no adverse cumulative effects would be expected.

Recreation Maintenance

Routine maintenance of trails and developed and dispersed recreation sites would not contribute to the cumulative impact on fisher habitat because maintenance of these facilities do not typically involve removal of old growth elements such as large trees or snags unless deemed to be a safety hazard to forest users. In this situation, the removal of a tree or snag is considered negligible.

Special Uses

There are areas previously impacted by special use permits such as gravel pits, building sites (fire station), fish weir, utility corridors, private land access routes, and outfitter/guide trails that will continue to be present and utilized. The ground disturbances on resources, such as riparian habitat and old growth, have been included under the existing condition and would have no additional impacts.

Public Use

Firewood gathering would continue to remove some snags from riparian areas and old growth along open road corridors and these acres were previously accounted for as part of the existing condition. Other forest use activities such as mushroom and berry picking, camping, hunting, Christmas tree cutting, bough collection, etc have little to no measurable impact on these specialized habitats because they are largely non-consumptive or rapidly re-established and would not contribute to the cumulative effect on this resource.

Private Property

If private land owners build their estimated 12.5 miles of road and harvest an estimated 25 acres based on 5 homesites, there would likely be a decrease in dry-site old growth within the PSU, but outside of NFS lands and primary fisher habitat.

Other Lands

The state of Montana is proposing to thin 50 acres immediately adjacent to existing old growth blocks in T37N, R28W. This activity should have beneficial effects on neighboring old growth in that the thinning may prevent old growth loss due to any wildfire initiating on these State lands. Being that these lands would only be thinned and not regenerated, there should be little cumulative edge effect to neighboring NFS old growth blocks and potential fisher habitat.

Summary of Cumulative Effects

As previously stated, fire suppression over the last century has altered stands historically maintained by fire disturbance. The affected stands have developed fuel loading and ladder fuels that are uncharacteristic for some sites. These conditions would continue to develop into quality fisher habitat until a natural disturbance occurs.

Potential natural disturbances (wildfire, insect or disease epidemics, wind) could reduce old growth characteristics or completely remove an area of fisher habitat under extreme conditions. Likewise, there is the potential for human caused fires initiating on private lands to move on to adjacent NFS lands and remove old growth and possibly riparian habitats that have not been, at least partially, managed either by prescribed burning and/or removal of ladder fuels. In either case, if the large tree component of old growth is removed then replacement old growth would need to be designated.

The most recent Forest-wide old growth analysis concludes that at least 10% of the KNF below 5500 feet elevation is designated for old growth management, much of which is in riparian areas and available to fisher. The proposed activities would not affect the 10% standard for old growth at either the PSU or Forest scale.

Regulatory Consistency

Forest Plan

All alternatives are consistent with Forest Plan direction to maintain a minimum of 10% old growth below 5500 feet in elevation in each third order drainage or compartment, or a combination of compartments (Kootenai Supplement No 85; supplement to FSM 2432.22).

Based on April 26th, 2004 direction (Castaneda 2004), old growth will be analyzed at the PSU scale. After implementation of the action alternatives, the Young Dodge PSU would have 10.3% designated old growth below 5500 feet elevation. In addition, 1147 acres of undesignated old growth would remain. The most recent Forest-wide assessment as documented in the Forest Plan Monitoring and Evaluation Report

(USDA Forest Service 2007) shows that the Kootenai National Forest has 11.6% old growth designated (includes both effective and replacement). The Kootenai Forest Plan established that maintaining 10% of old growth habitat is sufficient to support viable populations of old-growth dependent species (Vol 1 II-1 7; III-54; Vol 2 A17).

- All Alternatives are consistent with Forest Plan riparian standards and guidelines (FP Vol 1 II-28 thru 33) as amended by INFS.
- Forest Plan direction (Vol. I; II-1; Goal A. 7) is to "Maintain diverse age classes of vegetation for viable populations of all existing native, vertebrate, wildlife species,… in sufficient quality and quantity to maintain viable populations".

MA 13 Recreation Standards: All alternatives comply with these standards. A forest closure order exists to off-highway vehicles that, restricts them to established roads and trails therefore limiting their effect on old growth.

MA 13 Wildlife and Fish Standards: All alternatives comply with these standards, which are largely passive and favor natural processes. Also refer to grizzly bear analysis.

MA 13 Range Standards: All alternatives comply. Due to the lack of available forage in old growth stands, use by grazing cattle is negligible.

MA 13 Timber standards: All alternatives comply with Standards 1 and 3. Unauthorized firewood cutting could impact snags located in old growth habitat, and this effect is taken into consideration in the cavity habitat analysis and accounted for under the existing condition.

MA 13 Facilities standards: All alternatives comply with Standards 2 and 3. All alternatives would continue to restrict motorized access on local roads where closures exist.

MA 13 Fire Standards: Planned ignitions. The proposed slashing and burning is consistent for all alternatives. The Forest Plan (Vol 1 III-56) states that planned ignitions are acceptable to maintain old growth characteristics (e.g. old growth ponderosa pine).

National Forest Management Act

The project complies with the National Forest System Land and Resource Management Planning rule of November 9, 2000, as amended by meeting Kootenai National Forest Land Management Plan direction for old growth and through the utilization of best science for potential impacts on old growth habitat and its MIS species.

The diversity requirement of NFMA is met by all alternatives as documented in the individual sensitive species and MIS analyses and supported by the statement of findings for each species.

Statement of Findings

Alternative 2 would have <u>no impact</u> on the fisher or its habitat.

Alternatives 1, 1M, and 3 <u>may impact individuals and/or their habitat, but will not likely contribute to a trend towards federal listing or cause a loss of species viability for the fisher</u>**.** This determination is based on: 1) no alternative proposes actions that would result in making available habitat in the PSU unsuitable for fisher use; 2) the small percentage of potential (modeled) habitat that either action alternative would alter; 3) the large patch sized proposed by the action alternatives are likely to benefit the fisher in the long-term by providing vast areas of interior habitat; and 4) RHCA guidelines protect the highest-quality fisher habitat along major stream courses in the PSU.; 5) no alternative results in an increase of open roads or an overall increase in human access in the PSU that would facilitate the trapping of fisher.

FLAMMULATED OWL

Data Sources, Methods, Assumptions, Bounds of Analysis

Flammulated owl population ecology, biology, habitat description and relationships identified by research are summarized in Hayward and Verner (1994). More recent research on nesting, food habits, home range and territories, and habitat quality conducted in Colorado, Idaho, and Montana is discussed in Linkhart (2001), Linkhart and Reynolds (1997), Linkhart et al (1998), Powers et al (1996), Wright (1996), and Wright et al (1997). That information is incorporated by reference. Flammulated owl occurrence data comes from recent District wildlife observation records and Forest historical data (NRIS Wildlife). Flammulated owl habitat was modeled using TSMRS vegetation data and running the Kootenai TSMRS / FACTS flammulated owl habitat model (KNF 2007; see project file).

The Kootenai National Forest "A Conservation Plan: Based on The Kootenai National Forest Land Management Plan, as amended, (Johnson 2004) determines potential population index (number of potential territories) for breeding pairs by dividing habitat acres by 40 acres. Changes to habitat and resulting potential population index were used to display the effects of alternatives.

The analysis boundary for project impacts and cumulative effects to individuals and their habitat is the Young Dodge PSU because of the small home range of the owl and the quantity of habitat available in the PSU. The boundary for determining trend or viability is the Kootenai National Forest.

Affected Environment/Existing Condition

A Kootenai National Forest status summary, of the flammulated owl, was documented by Johnson (1999 unpublished). The summary shows that potential habitat occurs across all eight planning subunits. Forestwide, there are 237,098 acres of potential habitat (Ibid). Field surveys have confirmed flammulated owl presence in six of eight planning units. The population size on the Kootenai National Forest is unknown (Ibid). The flammulated owl has been documented to occur in the Young Dodge PSU (1994).

More recent flammulated owl surveys, which consists of taped owl calls used in an attempt to solicit a response from nesting birds, have been conducted intermittently within the Young Dodge PSU over the last decade. Surveys in 2006 and 2007, however, were not able to duplicate the findings of the 1994 surveys and find the flammulated owl in the Young or Dodge Creek drainages. Unsuccessful surveys for this species can often be attributed to the presence and response from other owl species, especially great horned owls, which are known to prey on the flammulated. Once other owl species respond, the flammulated owl, out of self-preservation, typically do not answer solicited calls. Surveyors are trained to stop calling for flammulated owls when other (large predators) owls respond at a given survey point(s). Due to the abundance of great horned owls and the risk of predation, the flammulated owl can be difficult to find.

Implementation of the KNF TSMRS / FACTS Flammulated Owl Model (KNF 2007) indicated that there is approximately 12,463 acres of potential flammulated owl habitat on NFS lands within the Young Dodge PSU.

Environmental Consequences

Proposed timber harvest has the potential to impact flammulated owl habitat. Selective logging that removes large ponderosa pine or Douglas-fir trees can decrease the availability of early-season feeding sites, song and roost sites, and trees for snag recruitment in areas already limited in large snag abundance

(Wright 1996 77). Snag removal during timber harvest for OSHA safety standards also removes suitable habitat for flammulated owls.

Some research has suggested that flammulated owls are not likely to forage further than 300 feet from forest cover (Goggans 1985). Regeneration harvest creating areas greater than 300 feet from cover will likely receive minimal use. This equates to a harvest unit of about eight acres in size, or a relatively square unit 600 feet on each side. Those proposed regeneration harvest units that are greater than eight acres in size will, likely receive little or no foraging use until understory and mid-story canopies develop.

Prescribed fires and/or slashing may have short-term (2-3 years) negative effects on the availability of habitat for prey species, but in the long-term habitat for prey species would be maintained and/or increased due to the vigorous shrub/forb layer that would result from the fire. These activities would benefit flammulated owls (Illg and Illg 1994).

Direct and Indirect Effects

Changes in potential flammulated owl habitat caused by the various activities in the proposed project are shown in Sensitive Species Table 3-5.

Sensitive Species Table 3- 5 Acre Changes In Flammulated Owl Habitat on NFS Lands in the Young Dodge PSU

Activity Type	Alternative 2 (No Action)	Alternati ve 1	Alternative 1M	Alternative 3
Acres unsuitable due to regeneration harvest \1	N/A	707	285	630
Potential acres changed due to improvement harvest	93	600	718	658
Acres impacted by slash and/or burn	N/A	2315	2315	1322

1 Includes acres of all regeneration units greater than 8 acres in size as a worst case scenario.

Based on the sum of acres impacted from Sensitive Species Table 3-5 above, changes in suitable habitat acres and PPI values on NFS lands are displayed in Sensitive Species Table 3-6. Decreases in habitat quality may be less than displayed as not all harvest acres are regeneration, and slashing and burning activity impacts are short-term. However, this table displays a worst-case scenario as if all suitable snags, large-diameter trees, and other characteristics of suitable flammulated owl habitat were removed, at least in the short-term.

Sensitive Species Table 3- 6 Flammulated Owl Habitat and Cumulative PPI Changes by Alternative

	Existing Condition	Alt 2, No Action	Alternative 1	Alternative 1M	Alternative 3
Habitat Acres –Young Dodge PSU NFS lands (+/- % change)	12,463 (0)	-193 (-1.5%)	-8841 (-29%)	-9145 (-27%)	-9853 (-21%)
PPI –Young Dodge PSU (# potential territories)	312	307	221	229	246
Habitat Acres – Forestwide – NFS (+/- % Change)	237,098 (0)	236,905	233,476 (-1.5%)	233,780 (-1.4%)	234,488 (-1.1%)
PPI – Forestwide (# potential territories)	5927	5922	5837	5845	5862

No activities are proposed under Alternative 2, so no direct effect to flammulated owls would occur. Plant succession would continue, resulting in an increasing canopy closure and increasing density of understory conifers. This plant succession could have an indirect effect on flammulated owls if they occur in the area because the owls forage in open areas within the drier ponderosa pine and Douglas-fir forest. An increasing density of understory conifers would decrease the available habitat for prey species, and may also impede flight maneuvers needed for foraging (Illg and Illg 1994 58).

Alternatives 1, 1M, and 3 propose vegetation management activities that would reduce or impact the amount of flammulated owl habitat in the Young Dodge PSU (see Sensitive Species Table-3-5 above for acres by alternative). The changes in the amount of available habitat could result in a PPI change in the Young Dodge PSU (see Sensitive Species Table 3-6 above).

The improvement harvests would focus on promoting forest health by (see Sensitive Species Table 3-5 above for acres by alternative) favoring ponderosa pine and larch and removing smaller Douglas-fir trees that are competing for growing space. These stands are expected to retain the larger and older ponderosa pine and Douglas-fir trees in the overstory, while exhibiting a more open understory. Retaining large trees and snags in the overstory would preserve abandoned flicker and pileated woodpecker cavities, which are the primary nesting sites for flammulated owls. An upper-diameter size limit has been incorporated into the silvicultural prescriptions and larger-diameter trees may not be removed. On those improvement harvests logged with skyline or helicopter, few snags are expected to remain due to OSHA safety standards.

The proposed improvement (relocation) of the Robinson Mountain trail to the old South Fork Young Creek Trail #238 may impact some trees or snags contributing to potential flammulated owl habitat and other adjacent mature forest stands, but since the old trail prism would be utilized, this impact would be minimal. The potential for tree or snag loss at the trailhead along the open road #7205 has already been accounted for in the effects of road systems on snag capability in that any areas 100 feet from any road are considered to have a zero capability to produce snags suitable for owl nesting. The parking location is not adjacent to any mapped owl habitat and would have no measurable impact due to the effect of open road #7205. Likewise, the human disturbance associated with these recreation facilities are unlikely to disturb any nesting owls because they are not typically active during the day when most recreation activities occur. The likelihood of disturbance to roosting or nesting flammulated owls is especially unlikely because this species in a cavity nester.

The parking area (approximately one acre), restroom, and road relocation (0.4 miles) associated with the proposed boat ramp may alter some elements of flammulated owl habitat with the removal of individual trees, unsafe snags, or understory roosting habitat, depending on the presence of these elements in the proposed locations. However, the human disturbance associated with these recreation facilities are unlikely to disturb any nesting owls because they are not typically active during the day when most recreation activities occur. The likelihood of disturbance to roosting or nesting flammulated owls is especially unlikely because this species in a cavity nester.

There are no old growth areas or mature forest stands near the Robinson Lookout therefore there would be no impact on flammulated owls due to its renovation. Additionally, the presence of flammulated owls at this elevation (~7500 feet) is unlikely and certainly influenced by the lack of forested stands similar to old growth.

There would be no impacts on the flammulated owl from the renewal of existing special uses and outfitter and guide permits in the Young Dodge PSU because the habitat disturbance from these actions has already been accounted for in the existing condition or they are non-consumptive and would not impact any suitable habitat. Likewise, any owls that may utilize these areas would have already adjusted (i.e. relocated) from existing sources of human disturbance.

Cumulative Effects

Summary of the Existing Condition

Over the past 50 to 60 years, low-elevation timber harvesting in the PSU, has contributed cumulatively to the reduction or alteration of flammulated owl nesting and foraging habitat. These timber harvests typically removed or reduced the large diameter ponderosa pine and often thinned the understory affecting nesting, roosting, and foraging habitats. Stands thinned too much also allowed for increased predation on this small owl by larger owls, such as the great horned. Another forest management activity that has contributed both positively and negatively to flammulated owl habitat is fuels reduction in the urban interface where much of the low-elevation ponderosa pine forests grow. While the reduction of ladder fuels assist in maintaining the mature canopy trees and nesting snags, it also reduces thickets of young Douglas-fir that provide roosting and escape cover for fledgling owls. Contrarily, these same activities can have beneficial effects to the owl's foraging habitat.

Effects of Current and Reasonably Foreseeable Actions

The Cumulative Effects Worksheet, located in the Wildlife section of the Project File, contains the detailed analysis of all past, current, and reasonably foreseeable activities listed in Tables 3-1 and 3-2. All activities identified to occur within the Analysis Area that have the potential to affect the flammulated owl are discussed below.

Vegetation Management and Fuels Reduction Activities

The Dodge Mountain Pine Beetle thinning unit (93 acres) is planned for 2012 at the southernmost boundary of the Young Dodge PSU. This timber stand improvement project is not within any type of old growth that may serve as flammulated owl habitat, however it is adjacent to one block of undesignated replacement old growth and one block of undesignated effective old growth. This unit would not result in cumulative edge effects to any old growth due to its prescription therefore having minimal impacts on any flammulated owls possibly utilizing the area old growth. Although no owl nests are known to this thinning unit nor are they likely based on age of the stand, the acres of this project were accounted for under the No Action Alternative 2 in Table 3-1, above based on possible foraging use.

The action alternatives, in combination with other current and reasonably foreseeable actions including tree planting, precommercial thinning, and blowdown salvaging would maintain the designated management level of old growth by avoidance. Other than possibly annoying individual owls (i.e. disturbing roosting individuals) human disturbance from these activities would have minimal impacts on flammulated owls.

Livestock Grazing

Cattle grazing would not result in a change of old growth or mature habitats that provides nesting areas for this species, as it does not involve the harvest of trees, dead or alive. Additionally, changes to the grass/herbaceous layer of vegetation would not affect owl habitat characteristics and generally, due to the lack of ungulate forage in old growth and mature forest stands, cattle grazing is typically not an issue.

Noxious Weed Treatment

Weed treatment activities would not lead to any adverse effects on flammulated owls or their habitat because treatment of weeds would actually benefit forage species important to many species or their prey (USDA Forest Service 1997, 30). No loss or change in specific habitats (e.g. old growth, mature forests), including snags and down woody debris inhabited by this species would result from this activity because weed treatments primarily focus on the herbaceous layer along roads and in disturbed areas.

Fire Suppression

With the direction to suppress all wildland fires on NFS lands, construction of firelines, safety zones, and other control structures could impact individuals on a site-specific basis. Avoidance of known owl nests would be attempted during suppression efforts but some impacts may still occur. Due to the unpredictable nature of wildfires, contributions of fire suppression to the cumulative effect on this species can only be surmised. However, suppression activities (i.e. initial attack procedures) would also help protect known owl habitat by reducing the chances of a wildfire becoming a stand replacement event . Also refer to cumulative effects on old growth.

Road Management Activities

Although road restoration and maintenance projects (brushing, blading, gate repairs, culvert replacement etc.) may temporarily disturb roosting owls from a localized area or impact individuals, they typically benefit the species in the long-term, especially if the projects involve closing previously open road systems (refer to road decommissioning in Transportation/Water Sections. Also refer to cumulative effects on old growth.

Recreation Maintenance

Normal road and trail maintenance activities have the potential to remove nesting and foraging trees for the flammulated owl if they are close to a trail or road and present a safety hazard. Effects would include removing site-specific, individual trees, and would not be expected to contribute measurably to the cumulative effect on the owl.

Routine maintenance of dispersed recreation sites would not contribute to the cumulative impact on old growth, or other mature stands serving as owl habitat, because maintenance of these facilities do not typically involve removal of old growth elements such as large trees or snags unless deemed to be a safety hazard to forest users. In this situation, the removal of a tree or snag is considered negligible.

Special Uses

Operations of outfitter/guides would not result in any change to general and specialized flammulated owl habitats (e.g. old growth or mature forests, snags or down woody debris), as they do not involve the harvest of trees. There would be no cumulative effects to the owls or their habitats associated with these activities other than possible temporary and local disturbance of an area due to the presence of humans.

Permits associated with access to private homes, rights-of-way for utilities, and outfitter/guides are not expected to contribute cumulatively to the impact on the owl because they are limited to previously disturbed and hardened sites like trails and roads. There are no known land exchanges planned within the PSU at this time. For a discussion of existing private lands, please see below.

Public Use

The temporal occurrence of forest uses such as summer activities (camping, hiking, and berry picking) versus fall (hunting and firewood cutting) or winter (skiing and snowmobiling) activities, and the scheduling of management actions to avoid key time periods (nesting, rearing) when flammulated owls may be more sensitive to human disturbances, allow for the avoidance of measurable cumulative impacts. There may be some situations where isolated or localized cumulative effects may occur, due to an overlap of forest activities, but these situations are typically short in duration, and do not persist through the lifecycle of the owl, either temporally or spatially.

Other forest product activities occurring presently and typically on an annual basis are the gathering of pine cones, boughs and commercial gathering of Christmas trees. These activities occur throughout the PSU, and have little-to-no effect on the landscape due to the unspecific nature of the use and the low impact on the resources (foot traffic, hand tools). Additionally, Christmas trees are harvested from existing regeneration units, so this activity would have no cumulative effect on the specialized habitats of flammulated owls, such as old growth and riparian areas.

Private Property

If private land owners build their estimated 12.5 miles of road and harvest an estimated 25 acres based on 5 homesites, there would likely be a decrease in dry-site old growth within the PSU, but outside of NFS lands. Any cumulative effects to flammulated owls will be partially dependent on the duration (seasonal versus year-round) of use of these parcels and homes. Anticipated effects include species displacement, nest failure, habitat alteration and/or habitat loss. The potential acres of habitat loss or altered (approx. 50) were accounted for under the no action alternative in Sens. Spp. Table 3-6, above.

Other Lands

The state of Montana is proposing to thin 50 acres immediately adjacent to existing old growth blocks in T37N, R28W. This activity should have beneficial effects on neighboring old growth in that the thinning may prevent old growth loss, and therefore potential flammulated owl habitat, due to any wildfire initiating on these State lands. Being that these lands would only be thinned and not regenerated, there should be little cumulative edge effect to neighboring NFS old growth blocks as potential owl habitat. The disturbance associated with this activity may cause the owl to avoid the area during implementation. This project was accounted for under the no action alternative in Sens. Spp Table 3-6, above.

Summary of Cumulative Effects

Although, habitat changes, which add to those of the existing condition as previously described, would occur under the proposed actions, the Young Dodge PSU will continue to provide habitat for resident flammulated owls. Following implementation of the proposed activities, the Young Dodge PSU is expected to potentially provide suitable habitat for at least 221 nesting pair of flammulated owls with minimal effect on the Forest level to this species due to perpetuation of suitable habitat.

Regulatory Consistency

Forest Plan

- All alternatives are consistent with Forest Plan direction to maintain a minimum of 10% old growth below 5500 feet in elevation in each third order drainage or compartment, or a combination of compartments (Kootenai Supplement No 85; supplement to FSM 2432.22).
- Based on April 26th, 2004 direction (Castaneda 2004), old growth will be analyzed at the PSU scale. After implementation of the action alternatives, the Young Dodge PSU would have 10.3% designated old growth below 5500 feet elevation. In addition, 1147 acres of undesignated old growth would remain. The most recent Forest-wide assessment as documented in the Forest Plan Monitoring and Evaluation Report (USDA Forest Service 2007) shows that the Kootenai National Forest has 11.6% old growth designated (includes both effective and replacement). The Kootenai Forest Plan established that maintaining 10% of old growth habitat is sufficient to support viable populations of old-growth dependent species (Vol 1 II-1 7; III-54; Vol 2 A17).

- All alternatives are consistent with Forest Plan direction to maintain diverse age classes of vegetation for viable populations (FP II-1 #7) by maintaining appropriate amounts and quality of suitable habitat in order to maintain species viability based on best science.

National Forest Management Act

- The project complies with the National Forest System Land and Resource Management Planning rule of November 9, 2000, as amended by meeting Kootenai National Forest Land Management Plan direction for other resident species and through the utilization of best science for potential impacts on old growth/mature habitats and their associated species.
- The project complies with NFMA direction (16 USC 1604 (G)(3)(b) to "provide for diversity of plant and animal communities based on the suitability and capability of the specific land area in order to meet overall multiple-use objectives, and within the multiple-use objectives of a land management plan adopted pursuant to this section, provide, where appropriate, to the degree practicable, for steps to be taken to preserve the diversity of tree species similar to that existing in the region controlled by the plan.

Statement of Findings

Alternatives 2, 1, 1M, and 3 <u>may impact individuals and/or their habitat, but would not contribute to a trend toward federal listing or loss of species viability for the flammulated owl.</u> This determination is based on the fact that: 1) displacement could occur during implementation if owls are present in the action areas; 2 no alternative results in a long-term loss or alteration of suitable habitat within the PSU3) habitat change at the Forest scale is only -1 to -1.5%; 4) the potential decrease in PPI may not occur as surveys indicate because occupancy level is less than the densities estimated by the PPI , and potential to impact or displace an owl is low; 5) the prescribed burning and improvement harvest may improve potential habitat; and 6) Forest Plan standards related to flammulated owl habitat (old growth) are met.

TOWNSEND'S BIG-EARED BAT

Data Sources, Methods, Assumptions, Bounds of Analysis

Townsend's big-eared bat population ecology, biology, habitat description and relationships identified by research are described in the following: Christy and West (1993), Thomas and West (1991), Reel et al (1989), Perkins and Schommer (1991), Kunz and Martin (1982), Montana Natural Heritage Program (1993), Ross (1967), Whitaker et al (1977), and Pierson et al (1999). That information is incorporated by reference. Bat occurrence data comes from recent District wildlife survey records and Forest historical data (NRIS Wildlife) and other agencies (MNHP).

All known caves, mines, tunnels, or lakes, and old growth were located within the Young Dodge PSU. After reviewing District records and mineral maps no caves, mines or tunnels were identified. Additionally, old growth stands were identified using the Kootenai National Forest Old Growth Stand Layer because loose bark on snags provide summer roosting habitat.

The analysis boundary for project impacts and cumulative effects to individuals and their habitat is the Young Dodge PSU due to specific habitat serving as hibernacula and potential impacts on old growth. The boundary for determining trend or viability is the Kootenai National Forest.

Affected Environment/Existing Condition

A Kootenai National Forest status summary of the Townsend's big-eared bat was documented by Johnson (19990. Surveys of the Kootenai NF (1993-1995) by Hendricks et al (1995 1996) have located the species in all planning units (Johnson 1999) but no key roosting sites such as caves or mines have been located.

Big-eared bats are known to feed along forest edges, and can be associated with either dry or wet type coniferous forests. The species show a preference for old growth forest for roosting habitat (Thomas and West 1991). Young and mature forests are used for feeding (Ibid), with primary foraging areas near lakes (Grindal 1995). Based on this information, habitat is present in the Young Dodge PSU, and more specifically, within the Young and Dodge Creek drainage bottoms (Hendricks et al 1995 1996).

No mines, caves or tunnels are known to exist within the Young Dodge PSU. As the bats have the potential to roost in tree cavities (Perkins and Schommer 1991, MNHP 1993), the larger-diameter snags or trees with cavities in the area could be used for summer roosting. As discussed in the old growth section of this document, the Young Dodge PSU has 8.3% designated effective old growth, and 14.4% total old growth acres, both designated and undesignated. These stands and the remaining timbered habitat provide suitable roosting habitat in the form of large snags with cavities, as well as abundant foraging habitat across the forest landscape. The analysis for cavity habitat within the Young Dodge PSU determined that the cavity habitat potential (CHP) on NFS lands was 45.9%. Please see the Snag Habitat section of this document for more detailed discussion.

Environmental Consequences

Direct and Indirect Effects

Under Alternative 2, no activities are proposed, and no bats would be directly disturbed by any timber harvest or associated slashing and/or under burning. No direct effects to the Townsend big-eared bat would be expected. Plant succession would continue on many of sites, with increasing canopy closure and increasing density of understory conifers. This plant succession may have an indirect effect on the bat because they forage in open areas within forests and the increasing density of understory conifers may decrease the available habitat for prey species. It may also impede flight maneuvers needed for foraging. If a wildland fire was to occur, potential roosting in the form of snags could be both lost and created, but no direct effect on key roosting habitat would occur, as caves, mines, or rock outcrops (crevices) are not known to occur in the Young Dodge PSU. There would be no expected change in the existing condition with implementation of Alternative 2 in the short-term. On NFS lands, no direct effect to cavity habitat potential would occur, and CHP would remain at 45.9%.

Under Alternatives 1, 1M, and 3, regeneration and improvement harvest activities have the potential to disturb or reduce day roosting habitat (trees and snags with cavities or thick bark). The potential for reduction in snags was disclosed in Snag Table 3-2 in the Snag and Down Woody resource section. Improvement harvests that open up suitable habitat or edge habitat created, may improve foraging opportunities for bats that use the area. Underburning could both reduce and create snag habitat. Disturbance or mortality of Townsend big-eared bats could occur if bats were using a snag that was cut down. Displacement could occur during prescribed burning. Effects would be site-specific, affecting individuals rather than colonies, and are not likely to influence the viability of sensitive bat species.

The maintenance of old growth habitat would provide large-diameter tree and snag habitat through time, and snag levels would be maintained at a minimum of 40% through time to provide cavity habitat. None of the alternatives change the current designation of old growth.

The proposed improvement (relocation) of the Robinson Mountain trail to the old South Fork Young Creek Trail #238 may impact some trees or snags, but since the old trail prism would be utilized, this impact is considered negligible. The potential for tree or snag loss at the trailhead along the open road #7205 has already been accounted for in the effects of road systems on snag capability in that any areas 100 feet from any road are considered to have a zero capability to produce snags.

Likewise, the parking area (approximately one acre) and road relocation (0.4 miles) associated with the proposed boat ramp may result in a minimal loss of trees and snags to accommodate safe operation of vehicles. Due to the anticipated level of snag loss, impacts to the snag capability of the PSU and associated species are considered negligible. Renovation of the Robinson Lookout would not involve removal of any snags, nor the need to, therefore this activity would not impact the snag resource or Townsend's big-eared bats. Because bats are known to roost in old and abandoned buildings, the bat or other bat species may be present in the Robinson Lookout and temporarily displaced during renovations. The bat would likely return upon completion of activities or the following summer.

There would be no measurable impacts on the snag resource or Townsend's big-eared bats from the renewal of existing special uses and outfitter and guide permits in the Young Dodge PSU because the disturbance from these actions has already been accounted for in the existing condition. There could be single snag removal in any situations where permitted facilities or personnel may be damaged or threatened by a standing (leaning) dead tree.

Cumulative Effects

Summary of the Existing Condition

Past and present activities and natural occurrences that have contributed to the cumulative effects on the Townsend's big-eared bat or its habitat include timber harvest, wildfires, wildfire suppression, and the sealing of caves or mines. There are no recorded caves or mines within the Young Dodge PSU, so this effect is negligible. There have however been a variety of timber harvests (listed in Tables 3-1 and 3-2) and wildfires that have both reduced potential bat roosting habitat but also likely provided additional foraging areas for these species. Wildfires have also created snags suitable for roosting, even breeding for some bat species. The suppression of wildfires has also hampered this process. In general, the combination of these activities and processes are thought to have both created and reduced bat habitat and have had negligible cumulative effects on the Townsend's big-eared bat except those that have affected old growth or late-successional forest stands, where an abundance of summer roosting habitat is typically available. For more information on the cumulative effects to the snag resource, please refer to that section.

Effects of Current and Reasonably Foreseeable Actions

The Cumulative Effects Worksheet, located in the Wildlife section of the Project File, contains the detailed analysis of all past, current, and reasonably foreseeable activities listed in Tables 3-1 and 3-2. All activities identified to occur within the Analysis Area that have the potential to affect the big-eared bat are discussed below.

Vegetation Management and Fuels Reduction Activities

The Dodge Mountain Pine Beetle thinning unit (93 acres) is planned for 2012 at the southernmost boundary of the Young Dodge PSU. This timber stand improvement project may result in the loss of individual snags due to thinning activities or due to OSHA guidelines and were reflected under the No Action Alternative 2 effects on snags in Snag Table 3-3. This project would not impact old growth habitat that may provide suitable roosting / foraging habitat for this species.

The action alternatives, in combination with other current and reasonably foreseeable vegetation related actions including tree planting, precommercial thinning, Christmas tree cutting, wreath bough collection, character wood collection (log furniture), and blowdown salvaging would maintain the existing level of snags by avoidance with the exception of small snags possibly lost to character wood (furniture) gatherers. Most snags removed for furniture however are small diameter trees (<10" DBH) unsuitable for most cavity nesters and this impact is considered negligible.

Livestock Grazing

Cattle grazing would not result in a change of old growth habitat or snags in the PSU, as it does not involve the harvest of trees, dead or alive.

Noxious Weed Treatment

Noxious weed management would result in no loss or change in snags and old growth because weed treatments primarily focus on the herbaceous layer along roads and in previously disturbed areas.

Fire Suppression

Fire suppression activities including the construction of fire lines, helispots, and safety zones could potentially result in impacts to specialized bat habitats (e.g. old growth, snags). The amount and timing of such a loss cannot be predicted; however, the number of snags created by a wildfire would far exceed those lost during fire suppression efforts. Suppression activities are typically subject to input from District Resource Advisors, and protection of specialized habitats, including snags, is considered.

Road Management Activities

Road management actions such as road maintenance and administrative use associated with permit administration, data collection, and monitoring of NFS lands are not likely to affect specialized habitats (e.g. old growth habitat, snags), that may serve for bat roosting, because they generally do not result in vegetation removal. The standing tree and snag component would only be affected if considered a hazard to road users. These activities would not result in any change to the snag component, thus no adverse cumulative effects would be expected.

Recreation Maintenance

Routine maintenance of trails and developed and dispersed recreation sites could involve the harvest of snags or green replacement trees that pose a hazard to forest users. However, the scale of the impact would be small and not measurable as a cumulative effect to snag levels or associated species like the Townsend's big-eared bat.

Special Uses

There are areas previously impacted by special use permits such as gravel pits, building sites (fire station), fish weir, utility corridors, private land access routes, and outfitter/guide trails that will continue to be present and utilized. The ground disturbances on resources such as snags have been included under the existing condition and would have no additional impacts.

Public Use

Firewood gathering would continue to remove some snags from the open road corridors and these acres were previously accounted for as part of the existing condition. Other public uses such as wildlife viewing, berry picking, camping, snowmobiling etc. have negligible impacts on the snag resource. Most campers utilize down wood for campfires in lieu of felling additional dead wood so this impact would also be negligible due to scale or scope.

Private Property

If private land owners build their estimated 12.5 miles of road and harvest an estimated 25 acres, there would likely be a decrease in the overall PPL within the PSU, but outside of NFS lands. These acres are reflected in under the No Action Alternative 2 (Snag Table 3-3).

Other Lands

The state of Montana is proposing to thin 50 acres immediately adjacent to NFS lands in T37N, R28W. This activity could incidentally result in the removal of existing snags or when they pose a threat to forest workers according to OSHA. Being that these lands would only be thinned and not regenerated, there should be little cumulative impact to the snag resource, however these acres were accounted for in Snag Tables 3-3 and 3-4.

Summary of Cumulative Effects

Cumulatively, with all lands considered, and all other reasonably foreseeable actions on private and state lands considered, sufficient cavity habitat would remain in the Young Dodge PSU.

When other activities including the harvest on private, state, and federal lands discussed under Alternative 2, and all past, present, and reasonably foreseeable activities are considered, habitat on federal lands is considered sufficient to provide cavity habitat to cavity-dependent species. After implementation of Alternative 2 and the reasonably foreseeable Forest Service projects, the primary cavity excavator potential population level on NFS lands is estimated to remain at approximately 45.3% After implementation of Alternatives 1, 1M, or 3 and the reasonably foreseeable projects, the primary cavity excavator potential population level on NFS lands would decrease from 45.9% to 43.3, 43.8, or 43.5% respectively. This level of snag habitat is still expected to provide for an associated species population level above 40 percent, which is thought to be the minimum needed to maintain self-sustaining populations of snag-dependent wildlife (Thomas 1979 72).

The 2002 Forest Plan monitoring report (USDA Forest Service 2003) documents results for the past 16 years, and indicates the Kootenai National Forest is providing sufficient cavity habitat at the drainage or compartment, as well as the Forest scale.

Regulatory Consistency

Forest Plan

All alternatives meet FP direction for old growth, as previously disclosed, that may serve as Townsend's big-eared bat habitat.

All proposed units in Alternatives 1, 1M, 2, and 3 maintain at least 40% snag level. No alternative causes the Young Dodge PSU overall PPL to drop below the general forest 40% or riparian 60% primary cavity excavator potential population level. This is consistent with Forest Plan standards.

Kootenai Forest Plan cavity habitat standard (40% PPL) in MAs 15 and 16 is met.

Kootenai Forest Plan cavity habitat standard in MA 10 is met. Alternatives 1, 1M, and 3 would not require a project-specific amendment to suspend the requirement to retain all existing cavity habitat in MA 10. All treatment units would be managed to meet the 40% minimum snag level.

National Forest Management Act

The project complies with the National Forest System Land and Resource Management Planning rule of November 9, 2000, as amended by meeting Kootenai National Forest Land Management Plan direction for snags and cavity habitats and through the utilization of best science for potential impacts on cavity habitat and its associated species.

Statement of Findings

Alternative 2 would have no impact to sensitive bats or their habitat. This determination is based on: 1) no direct change in the current availability of roosting and hibernacular habitat would occur, and 2) foraging habitat and potential roosting habitat would remain distributed across the Young Dodge PSU and across the Kootenai National Forest.

Alternatives 1, 1M, and 3 may impact individuals and/or their habitat, but would not contribute to a trend toward federal listing or loss of species viability of the Townsend's big-eared bat. This determination is based on the fact that: 1) the action alternatives would not affect key roosting or hibernation habitat associated with caves and mines, or any buildings and no impacts to the species natality or mortality rates are expected; however, displacement from summer roosting sites (snags) could occur; 2) cavity habitat in the form of snags, wildlife trees, and leave trees would continue to be provided across the Forest in managed (no less than 40% snag habitat levels) and unmanaged areas; and 3) a forested environment suitable for foraging would remain distributed across the Young Dodge PSU and Forest-wide.

WESTERN TOAD

Data Sources, Methods, Assumptions, Bounds of Analysis

Western toad ecology, biology, habitat use, status and conservation are described and summarized in Maxell (2000) and Reichel and Flath (1995). That information is incorporated by reference. Western toad occurrence data comes from District wildlife observation records and Forest historical data (NRIS Wildlife) and other agencies (MNHP). The analysis boundary for project impacts and cumulative effects to individuals and their habitat is the Young Dodge PSU. The boundary for determining trend or viability is the Kootenai National Forest.

Affected Environment/Existing Condition

Western toads require over-wintering, breeding/rearing, and foraging habitat, and may also be dependent on habitats suitable for migration if the three required habitat types are isolated spatially (Maxell 2000 9). As summarized in Maxell (2000), over-wintering may take place in underground caverns or in rodent burrows; breeding/rearing takes place in aquatic sites such as shallow areas of large and small lakes or temporary ponds; and foraging habitat is largely in terrestrial uplands. The highest elevation the species has been documented in Montana is 9220 feet.

A Kootenai National Forest status summary of the western toad was documented by Johnson (1999). The species has been found in seven of the eight planning units. The population size is unknown and direct measures of population trend on the Kootenai are not available (Ibid 1999). However, many surveys have been conducted on the Forest since 1993. Surveys conducted between 1993 and 1995 located 63 adults. Of the 134 wetland sites surveyed during the 1993-94 field season, 10 had evidence of successful breeding (Werner and Reichel 1994); five additional sites were confirmed during the 1995 field season (Werner and Reichel 1996). Surveys of approximately 200 potential sites were conducted in the Bull River drainage during the 1997-98 field season, and evidence of breeding sites (tadpoles and eggs) were found at eight sites (Corn et al 1998). Historic and active breeding sites by planning unit on the Kootenai National Forest are summarized by Johnson (1999). Forest-wide, approximately 35 breeding sites were verified between 1995 and 1998 (Ibid).

There are three known breeding sites within the Young Dodge PSU. These sites are located in the Young Creek drainage. Their recent use status is unknown; however, adult toads are a common occurrence in the area and on the Rexford Ranger District based on yearly survey results from established monitoring sites. Additional breeding habitat is likely to occur in temporal ponds and road ditches. The terrestrial habitat within the Young Dodge PSU is considered upland foraging habitat.

Criteria used to compare the alternative impacts on the western toad and its habitat includes:

1) known breeding/rearing habitat impacted
2) acres of upland foraging habitat harvested and burned
3) acres of upland foraging habitat (prescribed burned only)

Environmental Consequences

Quantitative data regarding the western toad's use of upland and forested habitats is limited. Western toads are known to migrate between the aquatic breeding and terrestrial non-breeding habitats (TNC Database 1999). Movement of toads has been documented from 2.5 km to over 5 km between breeding sites (Corn et al 1998, Bartelt and Peterson 1994). Movement, in foraging areas, has been documented to be significantly influenced by the distribution of shrub cover, and toads may have avoided macro-habitats with little or no canopy and shrub cover (such as clearcuts) (Bartelt and Peterson 1994). Underground burrows and debris were important components of toad-selected micro-sites in a variety of macro-habitats. The western toad digs its own burrow in loose soil or uses those of small mammals, or shelters under logs or rocks, suggesting the importance of coarse woody debris on the forest floor (Ibid). Project activities (e.g. timber harvest, prescribed fire) that remove vegetation resulting in reduced canopy and/or shrub cover or reduced coarse woody debris are likely to impact western toad habitat and toad use patterns. Soil compaction from ground-based logging machines may impact over-wintering habitat (burrow sites).

Direct and Indirect Effects

Sensitive Species Table 3-7 summarizes the direct and indirect changes in habitat acres due to each alternative.

.Sensitive Species Table 3- 7 Toad Habitat Cumulatively Impacted by Alternative on NFS lands in the Young Dodge PSU

Comparison Criteria	Existing Condition	Alternative 2	Alternative 1	Alternative 1M	Alternative 3
Known breeding/rearing habitat impacted	0	0	0	0	0
Acres upland foraging habitat harvested / burned	354*	193	3069**	2115**	2864**
Acres upland foraging habitat treated by prescribed burned only	0*	0	4005**	3850**	2796**

*Existing condition column acres harvested or burned through 2007, most are considered to have enough cover for toad movement.

** Treated acres adding to the existing condition of acres not providing western toad cover (subtract these acres from 32,240 total cover acres to obtain the cumulative effect of alternatives.

Under Alternative 2, no Forest Service harvest or prescribed burning would take place. No direct effect to the western toad would be expected with this alternative. Plant succession would continue on all sites. Indirectly, this would result in an increase in canopy closure and density of understory conifers. This increase in canopy closure and understory conifer density would have no direct, or indirect effect on breeding habitat, and little, if any, effect on upland habitat. Fuel loads would continue to accumulate on the upland sites. Should wildland fire occur, typically aquatic breeding habitats would not be directly affected; however, surrounding upland habitat could be burned. Western toads have been noted to re-colonize burned areas the following year with vegetation re-growth (B. Maxell, Herpetologist, State Zoologist with MTNHP, personal communication April 2003, Troy Mt., J. Holifield (Libby District Biologist) personal observation).

Timber Harvest

Maxell (2000) showed the effect of timber harvest on amphibians in Montana. A review of the available literature by Semlitsch (2000) in the United States indicates timber harvest and road construction activities can impact aquatic breeding habitat by altering the hydrological cycle of wetlands that can impair completion of larval metamorphosis through early pond drying (hydroperiod shortened), or through increased predation (if hydroperiod is lengthened). Aquatic habitat quality can also be reduced by sedimentation and increased water temperatures.

The effects of timber harvest on upland habitats are summarized in Semlitsch (2000) and include elimination of shade, increase surface temperatures, disruption and compaction of soil structure, reduction in soil moisture, removal of coarse woody debris, and sedimentation of aquatic habitats from logging roads. Western toads are considered to be more terrestrial generalists (deMaynadier and Hunter 1998), and tend to be more tolerant than salamanders of forest edges, tree harvests, and declining patch size (Renkin et al 2004). However, because they are predominantly terrestrial, theproposed timber harvest activities could result in incidental mortality to western toads due to ground disturbance (crushing by logging equipment).

Alternatives 1, 1M, and 3 would be similar in their timber harvest effects. Please see Sensitive Species Table 3-7 for acreage comparisons. None of the action alternatives propose new road construction, however, the use of ground-based logging systems could crush individual toads, however limited the risk. If present, the toad would likely retreat under cover, underground, or move away from the disturbance during project activities.

Fire

A review of the available literature by Russell et al (1999) indicates that replacement of the fire-adapted vegetation by fire-intolerant associations indirectly leads to accompanying declines in overall herpetofaunal abundance and diversity. Without fire, species that use or can tolerate dense vegetation would be benefited, while those species that prefer open sites would continue to decrease through time.

There are few reports of fire-caused injury to herpetofauna even though many of these animals, particularly amphibians, have limited mobility (Russell et al 1999). The resultant microsite variation within burns may account for observations that fire has little effect on herpetofaunal species (Lyon et al 2000). Maintaining preferred or required habitat features presumably outweighs any fire-induced mortality that occurs (Russell et al 1999). Mortality may be associated with the direct and indirect effects of fire that alter prey availability or change shelter and microclimate (Lyon et al 2000, Russell et al 1999). Indirectly, although fire-induced disturbance may decrease herpetofauna within a particular patch, the prescribed burning should result in a mosaic of successional stages and habitat structure that should increase diversity on a broader scale (Russell et al 1999).

Site preparation burning in timber harvest units is also proposed under the action alternatives (see Sensitive Species Table 3-7). All activities associated with timber harvest, road decommissioning, intermittent stored service, and prescribed fire would be consistent with INFS and direct or indirect effects on riparian habitat (potential breeding sites) associated with the western toad would be unlikely. No harvest would occur within Streamside Management Zones.

There are areas proposed for roadside salvaging, as well as post and pole opportunities as part of this project. The potential for loss of down wood, as a result of these activities, was accounted for in the effects of road systems on snag capability in that any areas 100 feet from any road are considered to have a zero capability to produce snags and therefore, the larger down woody material that may facilitate toad movement and survival.

The proposed improvement (relocation) of the Robinson Mountain trail to the old South Fork Young Creek Trail #238 may impact some down trees or snags, but since the old trail prism would be utilized, this impact is considered negligible. The potential for down tree or snag loss at the trailhead along the open road #7205 has already been accounted for in the effects of road systems on snag capability in that any areas 100 feet from any road are considered to have a zero capability to produce snags and therefore, the larger down woody material. Similarly, these activities would have minimal effects on the shrub component of toad habitat other than the trail prism, therefore this impact is considered negligible.

The parking area (approximately one acre) and road relocation (0.4 miles) associated with the proposed boat ramp may result in a minimal loss of down trees and snags to accommodate safe operation of vehicles. Due to the anticipated level of down wood/snag loss, impacts to the snag capability of the PSU and associated species are considered negligible. Renovation of the Robinson Lookout would not involve removal of any down wood to facilitate repairs, therefore this activity would not impact the toad.

There would be no measurable impacts on the down wood/snag resource from the renewal of existing special uses and outfitter and guide permits in the Young Dodge PSU because the disturbance from these actions has already been accounted for in the existing condition. There could be single snag removal, and subsequent down wood, in any situations where permitted facilities or personnel may be damaged or threatened by a standing (leaning) dead tree. Other habitat components, such as wetlands or cover in the form of shrubs, would not be measurably impacted by these activities due to avoidance or scope of the activity.

Cumulative Effects

Summary of the Existing Condition

The combination of past timber harvest and years of wildfire suppression are believed to have resulted in a balance of cumulative impacts, both positive and negative, on western toad habitat. While timber harvest have opened forest canopies, removed down woody debris, possibly altered hydroperiods, as previously discussed, and created roads, wildfire suppression has largely had the opposite effect (also see Direct and Indirect Effects). With exception to trail and firebreak creation, wildfire suppression has maintained vast areas of thick forest canopy and an abundance of large woody debris on the forest floor, facilitating western toad travel across the landscape and has assisted in maintaining breeding/rearing habitat by protecting wet microsites.

Effects of Current and Reasonably Foreseeable Actions

The Cumulative Effects Worksheet, located in the Wildlife section of the Project File, contains the detailed analysis of all past, current, and reasonably foreseeable activities listed in Tables 3-1 and 3-2 . All activities identified to occur within the Analysis Area that have the potential to affect the western toad are discussed below.

Vegetation Management and Fuels Reduction Activities

The Dodge Mountain Pine Beetle thinning unit (93 acres) is planned for 2012 at the southernmost boundary of the Young Dodge PSU. This timber stand improvement project may result in the loss of individual snags, and subsequent down wood, due to thinning activities or due to OSHA guidelines and were reflected under the No Action Alternative 2 effects on snags in Snag Table 3-3, above. Otherwise, this project would have little impact on the ability of the western toad to move or forage across the landscape.

The action alternatives, in combination with other current and reasonably foreseeable vegetation related actions including tree planting, precommercial thinning, Christmas tree cutting, wreath bough collection, character wood collection (log furniture), and blowdown salvaging would maintain the existing level of down wood by avoidance with the exception of wood possibly lost to character wood (furniture) gatherers and that lost to firewood gatherers. Most wood removed for furniture however is small diameter trees (<10" DBH) unsuitable for most cavity nesters and this impact is considered negligible. Down wood lost to firewood gatherers within 100 feet of a road has already been accounted for in the PPL for snags. Otherwise, these activities would have little impact on the ability of the western toad to move or forage across the landscape nor measurably increase the risk of being crushed by equipment.

Livestock Grazing

Cattle grazing would not result in a change of cover or down woody debris in the PSU that serve as toad habitat, as it does not involve the harvest of trees, dead or alive.

Noxious Weed Treatment

Toads away from wetlands or breeding sites could accidently be sprayed with herbicides being utilized along road systems or within infested ungulate seasonal ranges (e.g. winter range). The effect of being sprayed is accounted for in the application rates/toxicity and chemicals disclosed in the 2007 KNF Invasive Plant Mangement FEIS (pp3-72 to 3-73). Any herbicide application within the Young Dodge PSU will be consistent with that document and its range of effects on amphibian species.

Fire Suppression

Fire suppression activities including the construction of fire lines, helispots, and safety zones could potentially result in impacts to specialized habitats (e.g. shrub layers and down woody debris). The amount and timing of such a loss cannot be predicted; however, the number of snags, and subsequent down wood created by a wildfire would far exceed those lost during fire suppression efforts. Low level vegetation, including shrubs, would be lost immediately following a wildfire, but would likely re-establish within 5years. Overall, fire suppression activities serve to protect general toad habitat and are typically subject to input from District Resource Advisors, and protection of specialized habitats, including down wood, is considered.

Road Management Activities

Road management actions such as road maintenance and administrative use associated with permit administration, data collection, and monitoring of NFS lands are not likely to affect specialized habitats (e.g. low level vegetation, down woody debris) because they generally do not result in vegetation removal. Down wood would only be affected if considered a hazard to road users. These activities could crush individual toads if present during operations. They could also result in the draining of potential breeding sites in ditch areas when water accumulation is a threat to the road.

Recreation Maintenance

Routine maintenance of trails and developed and dispersed recreation sites could involve the harvest of down wood that pose a hazard to forest users and the removal of low-level vegetation to facilitate human use. However, the scale of the impact would be small and not measurable as a cumulative effect to the toad, other amphibians and reptiles.

Special Uses

There are areas previously impacted by special use permits such as gravel pits, building sites (fire station), fish weir, utility corridors, private land access routes, and outfitter/guide trails that will continue to be present and utilized. The effects of ground disturbance on resources such as shrubs and down wood have been included under the existing condition and would have no additional impacts.

Public Use

Firewood gathering would continue to remove some snags and down wood from the open road corridors and these acres were previously accounted for as part of the existing condition. Other public uses such as wildlife viewing, berry picking, camping, snowmobiling etc. have negligible impacts on these resources. While campers may utilize down wood for campfires this impact would also be negligible given the amount used for this purpose versus the abundant amount available. These activities would have minimal impacts, if any, on low-level vegetation serving as western toad cover because of their limited scope.

Private Property

If private land owners build their estimated 12.5 miles of road and harvest an estimated 25 acres, there would likely be a decrease in cover and down wood within the PSU, but outside of NFS lands. These acres are reflected in under the No Action Alternative 2.

Other Lands

The state of Montana is proposing to thin 50 acres immediately adjacent to NFS lands in T37N, R28W. This activity could incidentally result in the removal of existing snags, and subsequent down wood, when they pose a threat to forest workers according to OSHA. Being that these lands would only be thinned and not regenerated, there should be little cumulative impact to shrub cover and down wood resources, however these acres were accounted for in Snag Tables 3-3 and 3-4. Individual toads could be crushed during the operations of these activities due to use of heavy machinery and vehicles.

Summary of Cumulative Effects

Cumulatively, with all lands considered, and all other reasonably foreseeable actions on private and state lands considered as described above, sufficient down woody debris would remain in the Young Dodge PSU. The 2002 Forest Plan monitoring report (USDA Forest Service 2003) documents results for the past 16 years may be the best indicator that standing dead and down habitat is being retained via management guidelines and recommendations. Additionally, based on district records, only 354 acres (1%) out of 32,594 (NFS lands) of timber harvest has occurred in the past 5 years within the PSU that may impede the movement of the western toad in the analysis area.

Regulatory Consistency

Forest Plan

There are no goals or standards for downed woody debris in the Kootenai Forest plan. It does contain the goal to: "Maintain diverse age classes of vegetation for viable populations of all existing native, vertebrate, wildlife species…. (FP Vol 1 II-1 Goal #7)". The Kootenai Forest Plan provides guidelines in

Appendix 16, Cavity Habitat Management (FP Vol 2 App 16 6 - Guideline #9). All alternatives are consistent with the Kootenai Forest Plan, as a wide range of successional habitats, and associated amounts of downed wood would be available for this species.

National Forest Management Act

The project complies with the National Forest System Land and Resource Management Planning rule of November 9, 2000, as amended by meeting Kootenai National Forest Land Management Plan direction for a variety of vegetation age classes and through the utilization of best science for potential impacts on this habitat resource.

Statement of Findings

Implementation of Alternatives 2, 1, 1M, and 3 may impact individuals or habitat, but would not likely contribute to a trend towards federal listing or loss of species viability for the western toad. This finding is based on: 1) removal and partial consumption of coarse woody material in upland sites due to harvest activities and/or prescribed fire; 2) the longer-term recruitment of coarse woody debris due to fire-killed trees falling over time; 3) no impact or change to the current availability of breeding habitat; 4) retention of riparian movement corridors; 5) the low risk of direct mortality during burning and the limited direct mortality risk during timber harvest activities; and 6) suitable habitat would remain in the Young Dodge PSU and well-distributed across the Kootenai National Forest.

WOLVERINE

Data Sources, Methods, Assumptions, Bounds of Analysis

Wolverine population ecology, biology, habitat description and relationships identified by research are described in Banci (1994) and Butts (1992). That information is incorporated by reference. Generally, their habitat is described by the U.S. Fish and Wildlife Service as high elevation alpine and boreal forests that are cold and receive sufficient winter precipitation to reliably maintain deep persistent snow into late spring and early summer (http://montanafieldoffice.fws.gov). A map of persistent snow areas is available in the project file for this document.

On December 14, 2010, the U.S. Fish and Wildlife Service published their 12 month finding on a petition to list the wolverine as endangered or threatened under ESA in the Federal Register (Vol. 75, No. 239, p. 78030). The FWS determined that the listing of the wolverine was warranted but precluded due to higher priorities and added the wolverine to its candidate species list. A candidate species is defined as “those taxa for which the Service (FWS) has sufficient information on biological status and threats to propose to list them as threatened or endangered.” Until listed under ESA, the wolverine will continue to be treated and considered a sensitive species for the KNF.

Wolverine occurrence data comes from recent District wildlife observation records and Forest historical data (NRIS Wildlife) and other agencies (MFWP). Because wolverines are habitat generalist, except for denning habitat, only wolverine denning habitat was modeled using TSMRS vegetation data and filtered through various queries based on referenced literature (see process document – wildlife, project file). The analysis boundary for project impacts and cumulative effects to individuals and their habitat is the Young Dodge PSU based on the resources needs (denning, foraging) of the species. The boundary for determining trend or viability is the Kootenai National Forest due to the mobility of the species and gene dispersal.

Affected Environment/Existing Condition

Wolverine observation and monitoring data indicates that there have been no documented occurrences of wolverines within the Young Dodge PSU, however, Johnson (1999) shows wolverine presence confirmed in seven of the eight planning units on the Kootenai.

Reudiger (1994) shows the Kootenai National Forest as a primary habitat area for wolverine. Modeling wolverine denning habitat identifies 174 acres of potential denning habitat in the Young Dodge PSU. Following the identification process outlined in Reudiger (Ibid), the Koocanusa planning unit (major drainage) is assigned as a secondary wolverine conservation area (Johnson 2004a). While Johnson (1999) modeled (Heinz 1997) about 12,000 acres of wolverine denning habitat on the Forest, this analysis focused on areas that typically carry snow cover until May 15 as described in Copeland etal (2010) where denning and rearing of wolverine kits would occur. Modeling wolverine potential denning habitat, according to Copeland etal (2010) identifies 9886 acres of potential denning habitat (area of snow cover until May 15) in the Young Dodge PSU. These acres are shown in Table 3-8 below.

Environmental Consequences

Sensitive Species Table 3-8 summarizes the changes in denning habitat acres due to each alternative.

Sensitive Species Table 3- 8 Wolverine Denning Habitat – Cumulative Changes by Alternative

	Alt 2 (No Action) (Existing Condition)	Alternative 1	Alternative 1M	Alternative 3
*Denning Habitat Acres – Dodge PSU (acres/+/-% change)	9886 ac (0)	-753 (-7.6%)	-623 (-6.3%)	-513 (-5.2%)
Denning Habitat Acres - Forest-wide (acres/+/-% change)	467,738 0	-753 -0.16%	-623 -0.13%	-513 (-0.11%)

* data source: KNF TSMRS model; acres of habitat that may hold snow cover until May 15 based on findings of Copeland etal 2010.

Direct and Indirect Effects

Alternative 2 would have no direct or indirect effects on the wolverine or its habitat based on lack of action in suitable habitat.

Each of the action alternatives would alter anywhere from 513 to753 acres of potential wolverine habitat, as defined, depending upon the alternative. These vegetative changes would result from a combination of timber harvest, thinning, and prescribed burns. (see Sensitive Species Table 3-8). Many papers (Joslin and Youmans 1999; Witmer et al 1998; Copeland 1996; Weaver et al 1996; Thomas 1995; Butts 1992) show that the wolverine is sensitive to human presence, which indicates that it is highly likely they would be displaced during project activities. Displacement distances, due to human activity, vary but in general the biggest impact for most species is shown to occur out to 0.25 to 0.33 miles or the nearest ridgeline (Christensen & Madel 1982; Schirato 1989; Frederick 1991; Grant et al 1998; Austin 1998). Distances can be farther depending on type of disturbance (e.g. helicopter flying and use of explosives– USFS 1988, IGBC 1990; or OHV in open country – Bury 1983, may displace animals up to one mile). Displacement distance for the proposed project is estimated to be one mile. Project implementation could result in displacement of wolverine from approximately 400 acres (around Unit 46). It is important to note that all of the proposed treatment units would not be active at the same time. The calculations above represent the worst case scenario from individual units, which, is typically the level of implementation. The most critical period for wolverine is denning (December 1-April 30). No project activities are allowed within one-half mile of potential denning habitat during this time frame, however this is typically not an issue because the high elevation snows of wolverine denning habitat prevents most vegetation management during the denning period.

The proposed activities for all action alternatives do maintain or move the wolverine habitat toward the desired secondary quality (as previously defined) condition in the Koocanusa drainage. The sub-drainage, including the Young Dodge PSU would continue to provide a moderate habitat quality condition. Wolverines are likely to continue using the available habitat.

Areas of mapped wolverine habitat that receive timber harvests (especially regeneration), thinning, burning, and skid trails, may accumulate higher levels of snow during the winter due to less overstory. However, these same areas would be more exposed and may lose their snow quicker in the spring. Other than this type of affect, the proposed alternatives are not expected to have any other impacts on the snow element of wolverine habitat.

The proposed improvement (relocation) of the Robinson Mountain trail to the old South Fork Young Creek Trail #238 may impact some trees or snags contributing to potential wolverine habitat, but since the old trail prism would be utilized, this impact would be minimal. The potential for tree or snag loss at the trailhead along the open road #7205 has already been accounted for in the effects of road systems on snag capability in that any areas 100 feet from any road are considered to have a zero capability to produce snags. The parking location is not adjacent to any mapped old growth that may provide for wolverine movement and scavenging.

Given that workers would be limited to summer or after snowmelt to renovate Robinson Lookout, there would be little disturbance to wolverine during the more critical winter months. Renovation activities would not disturb wolverine or marmot (primary prey species) denning habitat, so impacts to these species would be limited to possible avoidance of habitat in the vicinity of the lookout during reconstruction activities.

There would be no impacts on wolverine habitat from the renewal of existing special uses, including access permits, and outfitter and guide permits in the Young Dodge PSU because the disturbance from these actions has already been accounted for in the existing condition or they are largely outside of potential wolverine habitat. Conversely, the action alternatives would result in additional road storage or decommissioning that would benefit wolverine by reducing human access in the PSU.

Other recreation improvements proposed under this project, including the proposed boat ramp and parking area, are either in areas of existing high human use such as along open road systems or at existing trailheads, or out of wolverine denning habitat, etc. None of the action alternatives propose any new recreation facilities which may impact or reduce wolverine habitat.

Cumulative Effects

Summary of the Existing Condition

Given the general nature of wolverine habitat outside of its denning habitat, past forest management practices are thought to have contributed little to the cumulative impact on wolverine habitat with the exception of road construction. Road development has improved human access, especially motorized, into most forest drainages which in turn tends to increase the risk of wolverine mortality via incidental trapping, vehicle collision, or illegal harvesting. However, methods and tools used to manage for the threatened grizzly bear, since its listing in 1975, have had beneficial cumulative effects on wolverine by restricting motorized access to many high elevation forests and habitats within the PSU.

Effects of Current and Reasonably Foreseeable Actions

The Cumulative Effects Worksheet, located in the Wildlife section of the Project File, contains the detailed analysis of all past, current, and reasonably foreseeable activities listed in Tables 3-1 and 3-2. All activities identified to occur within the Analysis Area that have the potential to affect the wolverine are discussed below.

Vegetation Management and Fuels Reduction Activities

The Dodge Mountain Pine Beetle thinning unit (93 acres) is planned for 2012 at the southernmost boundary of the Young Dodge PSU. This timber stand improvement project is not within any type of old growth or riparian habitat that may facilitate movement of wolverines across the landscape. Although screening cover may be reduced on these acres, impacts on wolverines would be minimal because movement cover is not a necessity for the species.

The action alternatives, in combination with other current and reasonably foreseeable actions including tree planting, precommercial thinning, Christmas tree cutting, boughs, pine cone collecting, and blowdown salvaging would have little impact on wolverine or its primary habitat due to human avoidance of high altitude alpine environments and talus slopes during these activities.

Livestock Grazing

Cattle grazing would not result in a change of old growth habitat and riparian ecosystems, or down woody debris in the PSU that may facilitate wolverine use, as it does not involve the harvest of trees, dead or alive. Grazing cattle predominantly move along road systems and within past harvest units where an abundance of forage for livestock can be found. Primary wolverine habitat would not be impacted utilized by grazing cattle due to elevation and access.

Noxious Weed Treatment

Noxious weed management would result in no loss or change in wolverine habitat, as defined, because weed treatments primarily focus on the herbaceous layer along roads and in previously disturbed areas. Riparian ecosystems are considered to be more sensitive to herbicides and are largely avoided by noxious weed treatments. High-altitude alpine areas and talus slopes are largely inaccessible by weed treatment crews therefore there would be no disturbance to wolverines in primary habitat.

Fire Suppression

In the event of a wildfire, construction of fire lines, helispots, and safety zones could potentially result in impacts to old growth habitats, including riparian environments which may be utilized by wolverines. Conversely, wildfire suppression also serves to preserve existing old growth and riparian areas serving as wolverine scavenging/foraging habitat. Suppression activities are typically subject to input from District Resource Advisors, and protection of special habitats, including old growth, is considered. However, if cumulative effects to old growth habitat result in the habitat no longer functioning as old growth, additional old growth habitat would be designated.

Road Management Activities

Road management actions such as road maintenance and administrative use associated with permit administration, data collection, and monitoring of NFS lands are not likely to affect old growth and other specialized habitats (e.g. riparian corridors, down woody debris, talus slopes) , that may be utilized by wolverine, because they generally do not result in vegetation removal. The down wood component would only be affected if considered a hazard to road users or impedes passage. These activities would not result in any change to primary high-altitude wolverine habitat by avoidance, thus no adverse cumulative effects would be expected.

Recreation Maintenance

Routine maintenance of trails and developed and dispersed recreation sites would not contribute to the cumulative impact on wolverine habitat because maintenance of these facilities do not typically involve removal of habitat elements such as down wood, talus, snags unless deemed to be a safety hazard to forest users. In this situation, the removal of down wood, is considered negligible. Maintenance of trails and dispersed sites in alpine areas may temporarily disturb resident wolverines and marmots, but this impact would be short in duration and would not measurably impact habitat components such as talus.

Special Uses

There are areas previously impacted by special use permits such as gravel pits, building sites (fire station), fish weir, utility corridors, private land access routes, and outfitter/guide trails that will continue to be present and utilized. The ground disturbances on resources, such as riparian habitat and old growth, have been included under the existing condition and would have no additional impacts.

Public Use

Firewood gathering would continue to remove some down wood from riparian areas and old growth along open road corridors and these acres were previously accounted for as part of the existing condition. Other forest use activities such as mushroom and berry picking, camping, hunting, Christmas tree cutting, bough collection, etc have little to no measurable impact on these specialized habitats because they are largely non-consumptive or rapidly re-established and would not contribute to the cumulative effect on this resource. With the exception of berry picking, camping, and hunting, these activities would have little impact on wolverine or its primary habitat due to human avoidance of high altitude alpine environments and talus slopes during these activities.

Private Property

If private land owners build their estimated 12.5 miles of road and harvest an estimated 25 acres based on 5 homesites, there would likely be a decrease in dry-site old growth within the PSU, but outside of NFS lands and primary wolverine habitat.

Other Lands

The state of Montana is proposing to thin 50 acres immediately adjacent to existing old growth blocks in T37N, R28W. This activity should have beneficial effects on neighboring old growth in that the thinning may prevent old growth loss due to any wildfire initiating on these State lands. Being that these lands would only be thinned and not regenerated, there should be little cumulative edge effect to neighboring NFS old growth blocks and general wolverine habitat.

Summary of Cumulative Effects

As previously stated, fire suppression over the last century has altered stands historically maintained by fire disturbance. The affected stands have developed fuel loading and ladder fuels that are uncharacteristic for some sites. These conditions may contribute habitat for potential prey species of wolverines and facilitate movement in areas of frequent human use.

Potential natural disturbances (wildfire, insect or disease epidemics, wind) could reduce old growth characteristics or completely void an area of cover under extreme conditions. Likewise, there is the potential for human caused fires initiating on private lands to move on to adjacent NFS lands and remove old growth and possibly riparian habitats that have not been, at least partially, managed either by prescribed burning and/or removal of ladder fuels.

The most recent Forest-wide old growth analysis concludes that at least 10% of the KNF below 5500 feet elevation is designated for old growth management, much of which is in riparian areas and available to wolverines. The proposed activities would not affect the 10% standard for old growth at either the PSU or Forest scale. Likewise, the proposed activities would have no measurable impact on primary high-altitude habitat of the wolverine by avoidance. The prescribed burning in Unit 46 would have beneficial impacts on the foraging component for marmots, the wolverine's primary prey.

Regulatory Consistency

Forest Plan

All alternatives are consistent with Forest Plan direction to maintain a minimum of 10% old growth below 5500 feet in elevation in each third order drainage or compartment, or a combination of compartments (Kootenai Supplement No 85; supplement to FSM 2432.22).

Based on April 26th, 2004 direction (Castaneda 2004), old growth will be analyzed at the PSU scale. After implementation of the action alternatives, the Young Dodge PSU would have 10.3% designated old growth below 5500 feet elevation. In addition, 1147 acres of undesignated old growth would remain. The most recent Forest-wide assessment as documented in the Forest Plan Monitoring and Evaluation Report (USDA Forest Service 2007) shows that the Kootenai National Forest has 11.6% old growth designated (includes both effective and replacement). The Kootenai Forest Plan established that maintaining 10% of old growth habitat is sufficient to support viable populations of old-growth dependent species (Vol 1 II-1 7; III-54; Vol 2 A17).

- All Alternatives are consistent with Forest Plan riparian standards and guidelines (FP Vol 1 II-28 thru 33) as amended by INFS and by creation of SMZs.
- Forest Plan direction (Vol. I; II-1; Goal A. 7) is to "Maintain diverse age classes of vegetation for viable populations of all existing native, vertebrate, wildlife species,… in sufficient quality and quantity to maintain viable populations".

National Forest Management Act

The project complies with the National Forest System Land and Resource Management Planning rule of November 9, 2000, as amended by meeting Kootenai National Forest Land Management Plan direction for a variety of vegetation age classes and through the utilization of best science for potential impacts on this habitat resource.

Statement of Findings

Implementation of Alternative 2 would have <u>no impact</u> on the wolverine due to lack of action.

Alternatives 1, 1M, and 3 <u>may impact individuals and/or their habitat, but would not contribute to a trend toward federal listing or loss of species viability for the wolverine.</u> This determination is based on: 1) the low probability for wolverine displacement by human activities during the breeding and rearing seasons in the PSU; 2) the wolverine is a habitat generalist and is unlikely to be adversely impacted by incremental and temporary habitat alteration when undisturbed areas are linked throughout the landscape; 3) the action alternatives would only have short-term impacts on a maximum of 753 acres of potential denning habitat; and 4) prescribed burning Unit 46 with helicopter is likely to only temporarily displace any wolverines, if present, in the late summer, from approximately 400 acres and would have beneficial effects on foraging habitat for marmots, a primary prey species of wolverine.

GRAY WOLF

Data Sources, Methods, Assumptions, Bounds of Analysis

Strategies to protect and recover wolf populations in Montana, as well as the ecology, biology and habitat descriptions are outlined in the Northern Rocky Mountain Wolf Recovery Plan (USFWS 1987). The Northwest Montana (NWMT) Recovery area is one of three wolf recovery areas identified for the Northern Rocky Mountain wolf population (USFWS et al 2006). In 2009 (4-2-2009), Acting Director of the Fish and Wildlife Service, Rowan W. Gould published in the Federal Register (Volume 74, Number 62 pp 1512-15188) the removal of the gray wolf from the Federal Endangered Species List in portions of the Rocky Mountain distinct population segment (DPS) including those wolves in Montana and Idaho due to their recovery success. However, subsequent lawsuits challenging the delisting were filed in both Montana and Wyoming. Due to these lawsuits, the District Court of Montana set aside the 2009 delisting rule. Most recently, the Northern Rocky Mountain gray wolf, which includes Montana, has once again been recognized as a distinct population segment and delisted as part of the 2011 Department of Defense and Full-year Appropriations Act. This act was signed on April 15, 2011 by President Obama and on May 5, 2011 the revised List of Endangered and Threatened Wildlife took effect. Therefore the gray wolf is once again considered a sensitive species for the KNF.

The Kootenai National Forest is within the NWMT Recovery Area. Information for this recovery area is provided by the Rocky Mountain Wolf Recovery 2009 Annual Report (Sime etal 2010) and is incorporated here by reference. Wolf occurrence data comes from recent District wildlife observation records, Forest historical data (NRIS Wildlife), and other agencies (USFWS, MFWP).

Measurement indicators for this wolf analysis include the following key habitat components found in the Wolf Recovery Plan (USFWS 1987):

3) **Sufficient, year-round prey base for big game or alternate prey:** This component can be measured by adhering to Forest Plan big game management recommendations. For this planning area, elk management recommendations were applied. They include cover/forage ratios, road densities, opening sizes, key habitat features, movement areas, habitat effectiveness levels, and security levels. See the MIS section for details.

4) **Suitable and somewhat secluded denning and rendezvous sites**: Sensitivity to disturbance at den sites and subsequent abandonment varies greatly among individual wolves. One incident of human disturbance at the den may cause abandonment for some wolves, while other wolves will tolerate some human disturbance (Thiel et al 1998) and may not abandon dens unless there are repeated or severe incidents of disturbance (Claar et al 1999). One recommendation for protection of den sites from human disturbance includes restricting human access within a 1.5 mile radius of an occupied den from 4 weeks prior to whelping to the end of denning activity. Closure area should be irregular in shape to avoid pinpointing den locations. Rendezvous sites should be similarly protected (Frederick 1991). Den and rendezvous sites can also be protected by enacting timing restrictions on proposed activities within the denning/rendezvous site areas. These restrictions would limit operating periods to the fall or winter seasons when these sites are unoccupied.

5) **Sufficient space with minimal exposure to humans**: This component is associated with reducing the risk of human-caused mortality to wolves. Human disturbance and accessibility of wolf habitats (i.e. road densities) are the principle factors limiting wolf recovery in most areas (Leirfallom 1970; US Fish and Wildlife Service 1978; and 1987; all in Frederick 1991 and Thiel 1978). These components can be generally measured by maintaining open road density standards required by the Forest Plan, as well as maintaining any security habitat recommended in the big game habitat recommendations.

The analysis boundary for direct, indirect, and cumulative effects to the Kootenai South wolf pack and their habitat is the Young Dodge PSU because its scope is suitable for measuring impacts of the activities on large ungulate prey species resident to the PSU and because impacts can become diluted at larger scales.

Affected Environment/Existing Condition

At the end of 2009, there were 101 wolf packs in all of Montana, with 37 meeting breeding pair criteria. These packs contained a minimum estimate of 524 wolves (Sime etal 2010). The Montana portion of the Northwest recovery area supported 100 of those packs (37 were breeding packs). This area includes the Kootenai National Forest. There are currently 16 packs (6 breeding packs) using the KNF for all or part of their territories. These packs had a total 59 known wolves at the end of 2009 (Ibid) with no count numbers on several packs. There were 30 known mortalities in the KNF packs this past year from various causes ranging from unknown to control efforts.

The Kootenai South wolf pack uses the Young Dodge PSU as a portion of their home range. Since the pack was established in 2005 there have been no known depredations on livestock attributed to this pack, and one known wolf mortality (legal harvest in Canada). Currently, the pack includes two adults and nine pups and none of the pack members are radio-collared (Laudon 2012 email).

Prey Base: The Young Dodge PSU supports both summer and winter habitat for most big game species. White-tailed deer are the most abundant big game species found within the Young Dodge PSU. Most big game species are found in the PSU, however in fewer numbers than white-tailed deer. Together, this mix of species provides a good year-round prey base for wolves. See the MIS species section of this document for more information on elk habitat conditions and population status in the Young Dodge PSU. The elk was chosen as the MIS species for this PSU and is one of the key prey items for the Kootenai South pack. The management recommendations for this species are being met in this PSU (see MIS section).

Den and Rendezvous Sites: There are no known den sites in the Young Dodge PSU. There are no known rendezvous sites that have been used in the PSU since the pack was established. Once individual wolves are, again, fitted with radio collars, their activities will continue to be monitored, which will provided additional information on their use of the PSU.

Sufficient Space with Minimal Exposure to Humans: Open road densities by MA meet Forest Plan Standards other than in MA 12 which is slightly higher, at 0.81 miles/mi^2, than the standard of 0.75 miles/mi^2 within this PSU. The standard for MA 12 is exceeded due to arterial roads used by the public to access logical end-points for safe turn-around of vehicles. Security habitat recommendations for elk are within recommended levels (see MIS section for details).

Environmental Consequences

Direct and Indirect Effects to Alternatives

Alternative 2

No timber harvest or road openings/closings are proposed in this alternative. This alternative maintains current conditions for prey habitat and human access within the PSU, therefore maintaining the existing level of habitat security. A number of existing young timber stands would develop cover values over time.

Alternatives 1, 1M, and 3

Prey Base: As discussed in the effects analysis for elk, these alternatives would maintain and possibly improve habitat conditions for elk, one of the wolves' main prey bases within the Young Dodge PSU. Therefore, prey conditions for wolves are likely to at least be maintained with these alternatives. All habitat management recommendations for elk and other big game ungulate species are being met with this alternative except for the ORD standard of 0.75 miles/mi^2 under Alternatives 1 and 1M, as previously discussed (see MIS Table 3-2, MIS Elk), for a summary of the big game habitat parameters by alternative). Alternative 3 was designed to meet the ORD in MA 12, closing over one mile of public access.

Denning/Rendezvous Sites: There are no known denning or rendezvous sites within the PSU. Suitable habitat for denning or rendezvous sites would remain available following all alternatives.

Sufficient Space with Minimal Exposure to Humans: Open road densities by MA meet Forest Plan Standards in this alternative (see MIS section) with exception to MA 12 under Alternatives 1 and 1M, as previously discussed. Some temporary increases in risk from human-caused mortality could accompany localized road use by contractors during harvest activities (roads would not be legally accessible to the general public but unauthorized use could occur). This increased risk would be measurable during harvest activities. Effects would be limited to avoidance of activity areas and transient use could still occur.

Implementation of the South Fork Young trail re-location and the Young Creek boat ramp facets of the action alternatives would not measurably impact the wolf or its prey base. In both cases, little vegetation would be removed or altered. The re-location of this connecting trail to the Robinson Mountain trail is not expected to increase human use of the area and its associated trailhead would involve little more than sign placement, and possible expansion of a road turnout to facilitate vehicle parking. Because the location of the boat ramp is within the Koocanusa Reservoir pool area, there would be no impact to the wolf or its prey base. While the parking area for the boat ramp would likely remove some trees and vegetation, one acre of disturbance is considered a negligible impact compared to the amount of habitat available to this species and its prey within the PSU.

There would be no measurable impacts on wolf security from the renewal of existing special uses and outfitter and guide permits in the Young Dodge PSU because the facilities, utility corridors, or use areas are already established and their impacts (also to cover, road densities, special areas etc.) were accounted for under the existing condition. There are also no proposals for expansion of these permits under this project. Renovation of the Robinson Lookout would have little potential to impact the gray wolf or its prey based on the limited amount of suitable habitat for these species in this alpine area. Areas of higher quality foraging with better cover for escape are available elsewhere throughout the PSU.

Cumulative Effects

Summary of the Existing Condition

The combination of past management activities including timber harvests, trail and road construction, prescribed burning as well as natural forest altering occurrences have resulted in similar habitat conditions for wolves as described under the grizzly bear. The cumulative effects on the existing forest cover and prey base have largely been beneficial to the gray wolf, while the associated road/trail construction has likely contributed, at least inadvertently (vehicle collision), to a heightened risk of wolf mortality—facilitating human access. Generally, however, habitat for the gray wolf in the Young Dodge PSU remains highly suitable, regardless of human use, as is evident by their successful recovery into the area.

Effects of Current and Reasonably Foreseeable Actions

The Cumulative Effects Worksheet, located in the Wildlife section of the Project File, contains the detailed analysis of all past, current, and reasonably foreseeable activities listed in Tables 3-1 and 3-2. All activities identified to occur within the Analysis Area that have the potential to affect the gray wolf are discussed below.

Vegetation Management and Fuels Reduction Activities

The Dodge Mountain Pine Beetle thinning unit (93 acres) is planned for 2012 at the southernmost boundary of the Young Dodge PSU. This timber stand improvement project may result in a slight alteration of cover, however, will certainly improve prey habitat conditions on ungulate winter range.

The action alternatives, in combination with other current and reasonably foreseeable vegetation related actions including tree planting, precommercial thinning, Christmas tree cutting, wreath bough collection, character wood collection (log furniture), and blowdown salvaging would not measurably contribute to cumulative impacts on prey cover, security, habitat effectiveness, or special areas as they do not involve creating or opening roads and have little to no impact on cover that could increase risk of wolf mortality by humans.

Livestock Grazing

Although grazing allotments cover several thousand acres of the PSU, competition between cattle and prey species for forage is not expected to be an issue. Domestic cattle typically utilize forage areas readily available along roadsides and recently harvested areas that have more gentle slopes whereas resident ungulates are more widespread across the landscape.

Noxious Weeds

Weed treatment activities would not lead to any adverse effects on wolf prey species or their habitat because treatment of weeds would actually benefit forage species important to elk and other big game species (USDA Forest Service 1997 p30).

Fire Suppression

In the event of a wildfire, construction of fire lines, helispots, and safety zones could potentially result in displacing elk and other big game prey from site specific areas until the event is contained. Upon completion of wildfire suppression activities, rehabilitation of these same areas can create micro-foraging areas because these sites are seeded for soil stabilization.

Road Management Activities

Road management actions such as road maintenance and administrative use associated with permit administration, data collection, and monitoring of NFS lands are not likely to measurably contribute to the cumulative impact on prey habitat due to their limited scope (time and space). On occasions when high use areas may be impacted, such as calving areas, impacts would be mitigated with design criteria including timing restrictions.

Although water restoration projects may temporarily displace prey species from a localized area, they typically benefit ungulates in the long-term by increasing security, providing pulses of foraging when seeded, or by simply stabilizing soils where certain habitat components can remain available (see Water and Transportation Sections).

Recreation Maintenance

Actions such as road or trail maintenance and administrative use associated with permit administration, data collection, and monitoring of NFS lands are not likely to measurably affect elk and other big game prey species. These species will typically simply avoid the disturbance area until human activities terminate, which usually comprises of a few hours.

Special Uses

There are areas previously impacted by special use permits such as gravel pits, building sites (fire station), fish weir, utility corridors, private land access routes, and outfitter/guide trails that will continue to be present and utilized. The ground disturbance on resources such as ungulate winter range, habitat effectiveness and cover etc. have been included under the existing condition and would have no additional impacts.

Public Use

Other public uses such as wildlife viewing, berry picking, firewood gathering,camping, snowmobiling etc. have negligible impacts on ungulate prey species and wolves given their limited scope (time and space). Infrastructure, such as roads and campgrounds, that facilitate these activities have already been accounted for under the existing condition.

Private Property

If private land owners build their estimated 12.5 miles of road and harvest an estimated 25 acres, there would likely be a slight impact on ungulate cover and security, especially on winter range where most privately owned acres occur.

Other Lands

The state of Montana is proposing to thin 50 acres immediately adjacent to NFS lands in T37N, R28W. This activity could incidentally result in the removal of ungulate/wolf cover and security on winter range.

Summary of Cumulative Effects

Timber sales and other management projects, such as salvaging, road work, precommercial thins, and fuels reductions, listed in the tables mentioned above may have temporary effects on wolves and ungulate prey species. These effects may include avoidance of activity areas, increase in vulnerability during the hunting season, raised stress levels, and short-term displacement from key habitats, like foraging areas or rendezvous sites. Although these effects may occur, they are not expected to result in lower prey populations due to the utilization of seasonal design criteria, such as avoidance of the calving season. Contrarily, vegetation management activities can have beneficial effects, once management activities cease, by providing additional and or reconditioned areas of ungulate foraging. Other forest activities such as hiking and berry picking are thought to have minimal impacts to wolves and prey species, typically resulting in temporary (hours) avoidance of an area.

The temporal occurrence of forest uses such as summer activities (camping, hiking, and berry picking) versus fall (hunting and firewood cutting) or winter (skiing and snowmobiling) activities, and the scheduling of management actions to avoid key time periods (spring calving and nesting) when wildlife may be more sensitive to human disturbances, allow for the avoidance of measurable cumulative impacts to wolves and ungulate prey species. There may be some situations where isolated or localized cumulative effects may occur, due to an overlap of forest activities, but these situations are typically short in duration, and do not persist through the lifecycle of any one species, either temporally or spatially.

REGULATORY CONSISTENCY

Forest Plan

All alternatives meet Forest Plan direction for big game species (FP Vol 1 II-1 #12) by maintaining appropriate amounts and quality of suitable habitat in order to maintain species viability.

All alternatives, with their associated Forest Plan amendments and Regional Forester approval for the over 40 acre unit request, are consistent with the Kootenai Forest Plan (1987) by meeting FP or best science habitat parameters which in turn maintain available and suitable habitat .

Alternatives 1, 1M, and 2, with their associated Forest Plan amendments approving an open road density of 0.81 mi/mi2 within MA-12 (FP Vol. 1, III-51 #3), will be consistent with the Kootenai Forest Plan (1987) because it maintains habitat effectiveness levels (68%) supported by best science. The 5.4 acres made unavailable under these alternatives is considered negligible compared to the 319,170 acres of MA 12 available on the Forest (Johnson 2006).

National Forest Management Act

The project complies with the National Forest System Land and Resource Management Planning rule of November 9, 2000, as amended by meeting Kootenai National Forest Land Management Plan direction for a variety of vegetation age classes and through the utilization of best science for potential impacts on this habitat resource.

Statement of Findings

Alternative 2, due to lack of action, <u>will have no impact on the gray wolf or its habitat.</u>

Alternatives 1, 1M, and 3 <u>may impact, but will not contribute to a trend toward federal listing or loss of species viability</u> based on the fact that: 1) proposed road restrictions would maintain and possibly slightly increase habitat security within the PSU; 2) mortality risk to the wolf is not expected to measurably increase during proposed activities and would decrease slightly after post sale activities are completed in-conjunction with an increase in grizzly bear core area (see Grizzly bear section); 3) alternatives would not affect known denning/rendezvous sites; 4) there may be a short-term avoidance of areas of activity however transient use could still continue; 5) alternatives meet forest plan big game management recommendations with only a slight reduction in available habitat due to ORD in MA 12 summer range.

THREATENED AND ENDANGERED SPECIES

Regulatory Framework

The Endangered Species Act (ESA) of 1973 declares that all Federal agencies " utilize their authorities in furtherance of the purposes of this Act by carrying out programs for the conservation of endangered species and threatened species listed pursuant to Section 4 of this Act." The ESA (Section 7) requires federal agencies to ensure that any agency action (any action authorized, funded, or carried out by the agency) is not likely to jeopardize the continued existence of any threatened, endangered, or proposed species. Agencies are further required to develop and carry out conservation programs for these species.

The National Forest Management Act (NFMA) (36 CFR 219.19) directs the Forest Service to "provide for diversity of plant and animal communities based on the suitability and capability of the specific land area in order to meet overall multiple-use objectives." [16 U.S.C. 1604(g) (3) (B)]. Providing ecological conditions to support diversity of native plant and animal species in the planning area satisfies the statutory requirements [(36 C.F.R. 219.10(b)]. The Forest Service's focus for meeting the requirements of NFMA and its implementing regulations is on assessing habitat to provide for diversity of species.

Species List

A current species list for the Kootenai National Forest (KNF) was obtained from the U.S. Fish and Wildlife Service (USFWS) web site (http://montanafieldoffice.fws.gov) on 11/05/2007 and again on 11/02/2011. The FWS concurred with potential listed species distribution maps and resulting consultation areas for the KNF in 2001 (USDI USFWS Wilson). Species status in the influence area of the proposed project is shown in TES Table 3-1.

TES Table 3- 1 Threatened and Endangered Wildlife Species: Project Area Status

Species	ESA Status	Status in Analysis Area*	Comments**
Grizzly Bear	Threatened	K	2
Canada Lynx	Threatened	K	2

*Status Key:
K = This species is known to occur within the project area.
S = Suitable habitat exists and species is suspected to occur within project area.
NS = No Suitable habitat, species is not suspected to occur within the project area. No further analysis required.
1 = Analysis Area is outside Recovery Zone or reoccurring use area, or FWS agreed to consultation area
2 = Analysis area is inside Recovery Zone or reoccurring use area, or FWS agreed to consultation area

GRIZZLY BEAR

Data Sources and Life History

Grizzly bear population ecology, biology, habitat description and relationships identified by research are described in USFWS (1993), the annual progress reports for the Cabinet-Yaak grizzly bear research (Kasworm et al 1989-2007;2009) and Kasworm and Manley (1988). That information is incorporated by reference. Briefly, grizzly bears are habitat generalists, using a variety of habitats including the coniferous forests of northwest Montana and north Idaho. Habitat is generally dictated by food availability and distribution, as well as security from human disturbance and mortality. Because grizzly bears have large home ranges, large areas of habitat are required. Grizzlies occupy low-elevation riparian areas, snow chutes and meadows in the spring and late fall, and move up to higher sub-alpine forests in the summer, early fall and winter. Excavated dens, often above 6,000 feet, are entered after the first snowfall and occupied for four to five months. A majority of their diet is composed of vegetation (forbs, sedges, grasses, roots, berries, pine nuts), but also includes fish, rodents, ungulates and insects. Grizzly bear occurrence data comes from recent District wildlife observation records, Forest historical data (NRIS Wildlife), and other agencies (USFWS, MFWP).

Bounds of Analysis

Establishment and Appropriateness of Cumulative Effect Boundary

The proposed project is partially within the Cabinet-Yaak grizzly bear recovery zone (USFWS 1993). The Cabinet-Yaak Ecosystem is large and diverse, meaning that grizzly bear habitat and use in one part of the ecosystem may not be reflected throughout the whole ecosystem. Breaking the ecosystem down into smaller units, i.e. Bear Management Units (BMU), allows for analysis to consider effects associated with the activity's area of influence and so that potential effects will not be diluted by considering too large an area (IGBC 1990). The BMUs are biologically meaningful to grizzly bears in that they 1) are based on the average size of a female bear's home range, 2) provide seasonal and elevational movement in response to needs (e.g. food and denning habitat), and 3) provide contiguous, unobstructed habitat allowing for displacement (i.e. Core) (Christensen and Madel 1982, IGBC 1990). Delineating BMU boundaries using topographical features establishes a recognizable unit for management consistency, allowing for identification of management needs or concerns, activity planning, scheduling, coordination, and monitoring (Ibid) within and among adjacent ranger districts.

Christensen and Madel (1982), in Cumulative Effects Analysis Process chose a 515,000 acre cumulative analysis area which represented 56% of the Cabinet-Yaak recovery zone and was the focal point of mineral exploration and development on the forest. In this analysis it was assumed that if each smaller bear unit within that analysis area is maintained in a viable condition, the total of all bear units would remain a viable habitat. Based on that well established premise, the BMU has been consistently identified as the analysis area for analyzing and monitoring effects to the grizzly bear (IGBC 1990, IGBC 1994, McMaster 1995, IGBC 1998, KNF 2009).

Individual projects, like Young Dodge, proposed on the KNF include activities to improve conditions in affected BMUs and move towards compliance with the 2011 BO for the Forest Plan Amendments for Motorized Access Management with the Selkirk and Cabinet-Yaak Grizzly Bear Recovery Zones on the Kootenai, Idaho Panhandle, and Lolo National Forests. Progress on this effort is documented by the KNF by BMU in the annual Forest Plan monitoring and evaluation reports located in the project file.

Therefore, the analysis boundaries for Young Dodge project impacts to individual grizzly bears and their habitat are the East Fork Yaak Bear Management Unit (BMU #16) in the Cabinet-Yaak recovery zone and the West Kootenai grizzly bear outside the recovery zone reoccurring use polygon (here after BORZ polygon) (USFS 2009; Grizzly bear access amendment Level 1 meeting). The majority of the proposed activities are within the West Kootenai BORZ with the exception of prescribed burn Unit 46 and some roadside vegetation treatments off Forest roads 303 and 303J. The boundary for cumulative effects and making the effects determination is BMU 16 and the West Kootenai BORZ polygon.

Grizzly Bear Habitat Analysis Framework

Effects analysis for the Young Dodge Project on grizzly bears considers the 1993 recovery objectives, compliance with current management direction (2011 BO on the Forest Plan Amendments for Motorized Access Management within the Selkirk and Cabinet-Yaak Recovery Zones on the Kootenai, Idaho Panhandle, and Lolo National Forests), and best science. TES Table 3-2describes the recovery objective, the habitat parameters evaluated, and the basis for those parameters. Additionally, the origin and brief history of habitat measurement parameters used for the Young Dodge PSU grizzly bear analysis is provided in Appendix 8 of this document.

The best available science was considered during this analysis. This includes Mace and Manley (1993), Mace et al. (1996), Mace and Waller (1997) all reviewed in Allen et al. (2011). The science also includes Proctor et al. (2008) as well as Wakkinen and Kasworm (1997). However, as with most science there are limitations of the data. Detailed explanations/reviews, including Allen et al. (2011), of the limitations of the Wakkinen Study are discussed in Appendix 9 of this document. Proctor, is summarized below.

Briefly, Proctor et al. (2008) examined data for five bears in the south Purcell Mountains, extending into northwestern Montana and sharing trans-border bears with the CYE. Proctor et al. (2008) did not examine the female grizzly's selection of home range to the whole ecosystem, but did compare it to what was available within their respective BMUs. All three successful females selected their individual home ranges with higher core than available in the BMU, averaging 51% (44, 54, and 55). Even at this higher order of selection, the percent core is similar (average of 55%, ranging from 40, 53, 53, 54, 55, to 72) to Wakkinen and Kasworm (1997). Open road densities are also similar between the studies, 1.2 km/km2

(0.46 mi/mi2) vs. ≤ 1 mi/mi2 (Proctor et al. 2008 and Wakkinen and Kasworm 1997, respectively). In contrast, two unsuccessful females in this ecosystem selected home ranges of only 19% and 29% core (Proctor et al. 2008).

Proctor et al. (2008) describe the trapping difficulty to get a larger sample size, especially for female bears. Given that they are attempting to study a small population, there is a “paradox that we’re trying to understand and predict use of habitat by females in an ecosystem where they are critically low” (Ibid). Ultimately, localized information strengthened by other research will give the best representation of what is used by the population in question.

TES Table 3- 2 Recovery Objectives, Parameters and Basis Guiding Grizzly Bear Analysis

Objective	Parameter	Basis for Parameter
1. Provide adequate space to meet the spatial requirements for a recovered grizzly bear population	a. Core areas/[1] b. OMRD/[1] c. TMRD/[1]	a. FP Standard (III-59 and Appendix 8-10); 1995 BO term and condition; 2004 BO term and condition and recommendation from Wakkinen and Kasworm (1997) b. 1995 BO term and condition; 2004 BO term and condition and recommendation from Wakkinen and Kasworm (1997) c. 1995 BO term and condition; 2004 BO term and condition and recommendation from Wakkinen and Kasworm (1997) d.
2. Manage for an adequate distribution of bears across the ecosystem.	a. Opening size b. Movement corridor c. Seasonal components d. Road density and displacement (core)	a. Recommendations from Grizzly Bear Guidelines meeting (Harms 1990) b. FP Standard(III-59 and Appendix 8-10) c. FP Standard (Appendix 8-10); and recommendations from USFWS and KNF meeting (Brooks 1992) d. See Objective 1
3. Manage for an acceptable level of mortality risk	a. Opening size b. Movement corridors c. Road density d. Displacement e. Attractants	a. See Objective 2 b. See Objective 2 c. See Objectives 1 and 6 d. See Objectives 1 and 6 e. FP Standard (Appendix 8-9, 11, 12, 14 and 16)
4. Maintain/improve habitat suitability with respect to bear food production	a. Objectives 1 and 2 b. How does project improve food sources	
5. Meet the management direction outlined in the Interagency Grizzly Bear Guidelines (51 Federal Register 42863) for management situations 1, 2, and 3	Achieved by meeting Objectives 1 through 4	
6. Meet the interim management direction specified in the July 27, 1995, Incidental Take Statement (McMaster 1995)	a. Open road density b. Open motorized trail density c. Total motorized access route density d. Existing Core area size	All reasonable and Prudent Measures in 1995 BO, see Objective 1

1 – Parameters under this objective were carried forward from 2004 Biological Opinion for the Kootenai, Idaho Panhandle, and Lolo National Forests Land and Resource Management Plans Amendment for Motorized Access Management within in the Selkirk and Cabinet-Yaak Grizzly Bear Recovery Zones to the subsequent 2011 BO.

* Objectives 1-5 were formulated to accomplish the KNF grizzly bear management goal to provide sufficient quantity and quality of habitat to facilitate grizzly bear recovery (Harms 1990)

As noted above, several parameters are based on recommendations found in Wakkinen and Kasworm (1997). These recommendations are: 1) a minimum of Core habitat of 55%, 2) a maximum of 33% of BMU with greater than 1 mile per square mile open motorized route density (OMRD), and 3) a maximum of 26% of BMU with greater than 2 miles per square mile of total motorized route density (TMRD).

The Wakkinen Study applied research techniques from Mace and Manley (1993) and Mace and Waller (1997) to local bear populations in the Selkirk and Cabinet-Yaak Ecosystems (SCYE). The Wakkinen Study was peer reviewed by nine biologists, whose comments were incorporated in the final report. Wayne Kasworm, grizzly bear researcher with the USFWS, and Wayne Wakkinen, grizzly bear researcher with the Idaho Department of Fish and Game, have over thirty years of experience monitoring grizzly bear populations in the SCYE.

Habitat Selection

Mace et al. (1996) and Mace and Waller (1997) point out the importance of other habitat components as determinants of grizzly bear habitat selection. Specifically, their data emphasized that habitats were used primarily because of their attractiveness as a food source and that displacement from roads occurred as a subsidiary element of grizzly bear habitat use (e.g., spring habitat selection near roads in Mace et al. 1996, and Waller et al. unpublished). In addition, food sources differ between the ecosystems. The Northern Continental Divide Ecosystem provides army cutworms and whitebark pine seeds, which are two food sources either not present or not found in large quantity in the Selkirk/Cabinet-Yaak Ecosystem. The physical location of these food sources contributes to habitat selection, which in the case of the Northern Continental Divide Ecosystem study resulted in bears selecting higher elevation areas (typically non-roaded or Core areas) where these foods are found.

Habitat Connectivity/Linkage/Fragmentation

The USFWS in their 2011 BO on the Forest Plan Amendments for Motorized Access Management within the Selkirk and Cabinet-Yaak Recovery Zones on the Kootenai, Idaho Panhandle, and Lolo National Forests, describe the importance of habitat connectivity or linkage for wildlife including the grizzly bear. Without this connectivity, species such as the grizzly bear, can be hindered physically (i.e.fitness and fecundity), demographically, and genetically (diversity/health). Habitat linkage or fragmenting factors that the Forest Service can address include the presence of highways, railways, forest roads, recreation developments and or use, and forest cover, These factors are addressed under the Young Dodge project based on their presence in the analyses areas (BMU / BORZ).

Land Uses versus Bear Needs

The IGBC Guidelines (1986) state*: Management decisions will favor the needs of the grizzly bear when grizzly habitat and other land use values compete. Land uses, within Management Situation 1 lands, which can affect grizzlies and/or their habitat, will be made compatible with grizzly needs or such uses will be disallowed or eliminated.* (IGBC Guidelines p. 3) Management situation 1 (MS-1) lands are those that contain grizzly bear populations, contain all the necessary elements for survival, and grizzlies are free to roam (USDI 1993). The IGBC guidelines do not provide a specific definition of “compete” or “compatible” however the intent of these provisions is made clear by the discussion in the IGBC guidelines regarding Forest Service Grizzly Bear management policy: *The FS will manage habitats essential to bear recovery for multiple land use benefits, to the extent these land uses are compatible with the goal of grizzly recovery. Land uses which cannot be made compatible with the goal of grizzly recovery, and are under FS control, will be redirected or discontinued. Management guidelines and* *objectives, the cumulative effects process, and goals for habitat capability and mortality will be used to guide activities which are compatible with grizzly bear recovery. It is also the policy of the Forest Service to facilitate recreation use in occupied grizzly habitat to the extent such levels or use are compatible with both human safety and grizzly recovery objectives* (IGBC Guidelines p. 2).Thus, it is apparent that the IGBC Guidelines recognize the multiple use nature of National Forest management. Furthermore, it is apparent that land uses which are, or can be made, compatible with grizzly bear recovery do not “compete” even if there is an impact on individual bears. Appendix 8 of the Kootenai Forest Plan incorporates management direction to meet the intent of the IGBC direction.

Affected Environment/Existing Condition/ & Environmental Consequences (Effects)

Cabinet-Yaak Ecosystem Population Information

Habitat conditions in the recovery zone have been improving steadily since 1987 as documented by Summerfield et al. (2004), and the annual Kootenai Forest Plan monitoring reports (monitoring item C7). Copies are located in the project file. The minimum population estimate for bears for the Cabinet-Yaak recovery zone has increased to 47 bears in 2008 based on current and previous captures and sightings of unique individuals (Kasworm et al. 2009). Table 3-3 below summarizes mortality information for the CYE.

There is an apparent decreasing trend in mortalities occurring on National Forest System (NFS) lands during the three time periods delineated for Table 3-3. This is true both in terms of the average number of bears killed per year among time periods, and the percentage of human-caused mortality within each time period. For the period 1999-2008, 19% of the total number of human-caused mortalities occurred on NFS lands. An estimated 82% of mortalities occurred on non-NFS lands or in Canada.

Causes of grizzly bear mortality have generally been due to factors beyond Forest Service control (e.g., train collision, management removal due to food attractant on private land, hunter mistaken identity or defense of life, and illegal kill by a human).

TES Table 3- 3 History of known grizzly bear mortalities within and around the Cabinet-Yaak Recovery Zone, by time period and land ownership (K. Annis pers. Comm. 2010, W. Kasworm pers. Comm.. 2010)[6]

Time Period	Known Grizzly Bear Mortalities Total No. / Ave. No. Killed Per Year		Human-Caused Mortalities by Land Ownership Total No. / Ave. No. Killed Per Year (Percent of Total No. of Human-Caused Mortalities)[1]		
	Overall	**Human-Caused**	**NFS lands**	**Non-NFS lands**	**Canada[2]**
1982-1986	4 / 0.66	3 / 0.60	3 / 0.60 (100%)[3]	0 / 0 (0 %)	0 / 0 (0 %)
1987-1998	12 / 1.00	9 / 0.75	5 / 0.42 (56%)[4]	1 / 0.08 (11%)[5]	3 / 0.25 (33%)
1999-2009	37 / 2.91	26 / 2.36	5 / 0.46 (19%)	16 / 1.46 (62%)	5 / 0.46 (19%)
Totals	53 / 1.89	38 / 1.36	13 / 0.34 (34%)	17 / 0.61 (45%)	8 / 0.29 (21%)

[1] Percentages are useful for comparing *within time periods only*, due to differences in the length of time represented by each of three time periods.
[2] Includes private and public lands. The CYRZ grizzly bear population extends into Canada.
[3] Includes one mortality that occurred outside of the CYRZ.
[4] Includes two mortalities that occurred outside of the CYRZ.
[5] Includes one (1) mortality that occurred outside of the CYRZ
[6] Table has not been updated with 2011 data.

A comprehensive program to minimize human-caused grizzly bear mortalities involves many elements, and the Forest is actively pursuing these opportunities and partnering with other agencies (2009 IGBC Accomplishment Report).

On the KNF there has been an increase in bear resistant garbage containers in developed campgrounds and a pack in/pack out policy for all other campgrounds and dispersed recreation sites. Many County refuse sites are being fenced to keep bears from attractants. For instance, just south of the Young Dodge EIS project area, the County refuse site now contains bear-resistant garbage containers.

Public education efforts are ongoing to encourage people to live in a way that is more compatible with the needs and behaviors of bears. Montana has instituted a mandatory black bear hunter testing and certification program to help educate hunters in distinguishing bear species and reducing mistaken identity. The KNF has installed signs along popular roads to inform people that they are in grizzly bear habitat and they include grizzly bear identification information.

On the KNF since 1987, wheeled motorized vehicle access on open roads has decreased (USDA Forest Service 2009c). In 1987, there were 6,200 miles of road (forestwide inside and outside the grizzly bear recovery zone) of which 73 percent (4,530 miles) were open to wheeled motorized vehicle use during the bear year. In 2008, there were 7,886 miles of road (inside and outside the grizzly bear recovery zone) of which only 36 percent (2,856 miles) were open to wheeled motorized vehicle use during the bear year. This results in a difference of 1,674 miles of roads open to wheeled motorized vehicle use between 1987 and 2008. In addition, since 2002 the total miles of road on the landscape have declined. In 2002, there were 7,954 miles of road and in 2008 the total was 7,886 miles, which results in a difference of 68 miles (ibid). Summerfield et al. (2004) also demonstrated reduced wheeled motorized vehicle access across the Cabinet-Yaak Recovery Zone.

In the KNF portion of the Cabinet-Yaak Recovery Zone as a whole, the average percent of a BMU with open road density greater than one mile per square mile has decreased (improved) from 31 to 30 percent since the 2004 Access Amendment (USDA Forest Service 2009c). The average percent of a BMU with total road density greater than two miles per square mile has held steady at 25 percent (ibid).

Since Core area was first implemented in 1998, the average percent Core area in a BMU across the KNF portion of the recovery zone has increased (improved) from 52 to 60 percent (not weighted) (USDA Forest Service 2002; 2009c).

Environmental Consequences Inside Recovery Zone

As previously stated, project activities would partially occur in the East Fork Yaak Bear Management Unit (BMU #16) (MAP 3-10). Bear activity in the associated BMU includes: one sighting of a female with young in the North Fork of Dodge Creek (1998); one sighting of a female with young in Porcupine Creek (1999); four mortalities since 1990 (3 in Montana; 1 in British Columbia); and several other sightings or sign documented since 1973 within this BMU.

The goal for grizzly bear management on the Kootenai National Forest is to provide sufficient quantity and quality of habitat to facilitate grizzly bear recovery. An integral part of the goal is to implement measures within the authority of the Forest Service to minimize human-caused grizzly bear mortalities. This goal is accomplished by achieving five objectives (TES Table 3-2) common to grizzly bear recovery as described by Harms (1990), and by a sixth objective specific to the Kootenai National Forest concerning acceptable incidental take (McMaster 1995). A number of measures are used to gauge whether the objectives are being met. The following analysis describes the potential effects of the selected action by examining how these measures are implemented and, thus, how the objectives relating to grizzly bear recovery are met. It is important to note that these habitat parameters inherently consider the cumulative effects of this action when added to other past, present and reasonably foreseeable actions; therefore this analysis reflects the cumulative effects of the alternatives.

TES Table 3- 4 Habitat Components Before, During, and After Implementation of Either Alternative 1, 1M, or 3

BMU	Habitat Component	Before	During	After
16	Core (% of BMU)	53	53	54
	OMRD (% BMU $\geq$ 1 mi./sq.mi.)	29	29	29
	TMRD (% BMU $\geq$ 2 mi./sq.mi.)	27	27	27

Objective 1. Provide adequate space to meet the spatial requirements of a recovered grizzly bear population.

*A. **Core Areas:** The requirements of a core area include: no motorized access (roads or trails) during the active bear season, and be at least 0.31 miles from open or gated roads. The goal is that federal agencies will work toward attaining a core area of at least 55% in the BMU. Another goal is that no net loss of core area will occur on federal ownership within the BMU. Refer to the Project File in the Wildlife Resources section for maps showing the results of this analysis. Core habitat blocks function as displacement areas.*

BMU 16: Existing core is composed of 12 areas that meet the core area definition and total 53% of the BMU. The closest core area of any size (22,242) to the Young Dodge Project is directly adjacent and to the west. Activities associated with the proposed action alternatives would not impact grizzly bear core habitat. No on-ground motorized vehicle access would be needed to conduct the prescribed burning of Unit 46. Core habitat would not be reduced during the burning of Unit 46 because no roads would be required for access. Unit 46 would be ignited through use of a helicopter. The procedure is only expected to involve one, 8-hour day of helicopter use and both Unit 46 and the helicopter flight path are on the eastern edge of the BMU 16 in the recovery zone with a 22,242 acre secure core area directly to the west to accommodate any disturbed bears. Helicopter units are buffered by a one mile displacement zone unless there are topographic or locality reasons for using the ¼ mile buffer. The available habitat impacted by the flight path and burn unit total approximately 9459 acres. Treatment Unit 46 was planned as a wildlife benefiting treatment in that it is located in high-altitude whitebark pine habitat, a seasonal food source for grizzly bears; a food source that is vanishing from the landscape as a result of fire suppression and competition from other tree species. These strategies are within guidance parameters suggested by the Guide to Effects Analysis of Habitat Use in Grizzly Bear Habitat (Summerfield etal 2006) and are unlikely to result in long-term effects on grizzly bear use of the area. Similarly, Støen etal (2010) suggest low-frequency helicopter approaches have greater effects on wild ungulates than brown bears but caution speculating behavioral comparisons between species too liberally.

There are no other activities planned within grizzly bear core habitat. The post and pole unit on Road 303, while inside the recovery zone, is located outside core habitat and its 0.31 mile buffer. Any grizzly bears disturbed by project activities could retreat to the 22,242 acre core area directly to the west of the Project Area. Following each of the action alternatives, core habitat would be increased to 54% as a result of placing Road 999 into intermittent stored service, and closing portions of Roads 303 and 303J. **Alternative 2 (No Action)** would not improve the percent of core habitat.

> ***B. OMRD: Open Motorized Route Density (OMRD)*** *is calculated on a BMU basis using moving window analysis. The goal is for no net increase in OMRD on National Forest System lands within the BMU.*

The existing OMRD is 29% (refer to TES Table 3-4). OMRD would remain at 29% during and following project activities because no additional access would be available to the general public and associated risk of mortality. No net increase in OMRD would result from the implementation of any action alternative. Likewise, there would be no net improvement (reduction) of OMRD following any alternative, including Alternative 2.

> ***C. TMRD: Total Motorized Route Density*** *is calculated on a BMU basis using moving window analysis. The goal is for no net increase in TMRD on National Forest lands within the BMU.*

The existing TMRD of BMU 16 for areas with greater than 2.0 miles per square mile of land base is 27% (refer to TES Table 3-4). During and following project activity, TMRD would remain at 27% for this category. No net increase in TMRD would result from the implementation of any action alternative. Likewise, there would be no improvement (reduction) of TMRD under any alternative, including Alternative 2 (No Action).

Objective 2. Manage for an adequate distribution of bears across the ecosystem.

> **A. Opening size:** *Proposed timber harvest units, either individually or in combination with existing unrecovered units should normally be designed to be less than or equal to 40 acres.*

All action alternatives propose treatment areas that are greater than 40 acres. These units were purposely planned over 40 acres as well as abstract in their landscape design in order to better emulate historic reference conditions where wildfires, windstorms, etc. created large areas of forage that later mature into vast areas of interior habitats. Large areas of forage, with secure cover nearby, can reduce the need of females with cubs to travel longer distances in search of food sources. According to Hamer and Herrero (as in USFWS 2011), most grizzly bear forage is found within early seral, non-forested areas including avalanche chutes and shrubfields. These areas also serve to maintain robust populations of resident ungulates which serve as a portion of the grizzly's diet. Given that some historic food sources, such as whitebark pine and army cutworm moths, are largely absent from this portion of occupied grizzly bear habitat, the provision of suitable foraging areas becomes even more important to maintain healthy, reproducing female grizzly bears. Additionally, the importance of having suitable foraging areas adjacent to secure cover is evident in that adult male grizzlies are known to kill juveniles and cubs, over food, breeding opportunities, and territorial defense (USFWS 2011). Female grizzlies are known to select dense, isolated forest cover to help reduce this risk of offspring mortality (USFWS 1993). Design criteria of the action alternatives leaves riparian areas and ridgelines intact, which would assist in grizzly bear movement across the landscape while large, treated areas naturally proceed through their vegetative stages.

B. Movement corridors: *Unharvested corridors >600 feet in width should be maintained between proposed harvest units and between proposed and unrecovered existing harvest units.*

As mentioned above, all action alternatives propose treatment units greater than 40 acres in size that can result in the removal of general movement corridors (see MIS Table 3-2, MIS Elk). The removal of movement corridors between units may impede grizzly bear use of localized areas in the short-term or create areas of unavailable forage, greater than 600 feet from cover, diurnally. However in the long-term, as part of the transition into more natural looking and typical disturbances, larger areas of interior habitat would be created resulting in less edge effect on the landscape. The larger openings alsoreduce the need for re-entry of forest management,which is also beneficial to the grizzly bear and many other species.

Although Alternative 3, like Alternatives 1 and 1M, proposes treatment units greater than 40 acres, it was designed to maintain movement corridors between existing and proposed openings, and to have no point of its proposed harvest units greater than 600 feet from cover. This strategy would result in a slightly greater edge effect than that of Alternatives 1 and 1M.

C. Seasonal components: *In areas with important seasonal components such as spring range, the guideline is to schedule proposed timber harvest activities to avoid known spring habitats during the spring use period (April 1 to June 15) and known denning habitats during the winter (October 15 to April 15).*

Den sites are not known to exist within the Analysis Area, so no timing restrictions would be needed relating to the denning period. There are portions of all action alternatives that occur within general forest habitats that may be utilized by grizzly bears in the spring. Measurable impacts to grizzly bears due to management activities concurrent with their use of spring range are not anticipated because logging activities are typically restricted in these areas due to the spring break-up period when area roads cannot be driven on by logging equipment. Management activities typically begin on the winter range in the spring and continue up in elevation as soil conditions allow the use of heavy equipment.

D. Road density and displacement (core) areas: These are discussed under Objectives 1 and 6.

Objective 3. Manage for an acceptable level of mortality risk.

Most human-caused grizzly bear mortalities on the Kootenai National Forest have resulted from interactions between bears and big game hunters (Kasworm and Manley 1988). Grizzly bear vulnerability to human-caused mortality is partially a function of habitat security. Therefore, mortality risk can be partially assessed by the use of habitat factors that maintain or enhance habitat security.

A. Opening size. See Objective 2.

B. Movement corridors. See Objective 2.

C. Road density. See Objective 1 and 6.

D. Displacement. See Objective 1 and 6.

E. Attractants. The action alternatives would not create any attractants such as garbage sources that increase the risk of conflict with humans. Logging operations are bound by contractual provisions to properly dispose of their waste products, including food attractants.

Taking into consideration the status of the habitat components listed above, mortality risk to the bear is generally low throughout most of BMU 16. It is important to note that human-caused grizzly bear mortality is also a function of other factors, such as the regulation of big game hunting, which are beyond the authority of the Forest Service to control. Regulation of hunting is the responsibility of the State of Montana. Cumulatively, risk-of-mortality would not change appreciably due to implementing any action alternative.

***Objective 4. Maintain/improve habitat suitability with respect to bear food production*.**

Timber harvest and post-harvest treatments such as prescribed burning, would generally improve the growth of forage plants important to bears. Treatment Unit 46 was specifically proposed to burn in whitebark pine habitat, an important late-season, high-elevation food source for grizzly bears.

Riparian habitats are generally considered to be valuable feeding sites. The proposed timber harvests do not include any riparian harvest and would follow other Kootenai Forest riparian management guidelines, Montana Streamside Management Act (HB 731), and INFS guidelines. Adherence to riparian area standards would ensure protection of the food resources in this important zone.

Objective 5. Meet the management direction outlined in the Interagency Grizzly Bear Guidelines (51 Federal Register 42863) for management situations 1, 2, and 3.

For grizzly bear MS-1 lands, (see Map 3-10) the Forest Plan, per IGBC guidelines directs that decisions will favor the needs of the grizzly bear when grizzly habitat and other land use values compete (please refer to Land Uses versus Bear Needs, above). Land uses which can affect grizzlies and/or their habitat will be made compatible with grizzly needs or such uses will be disallowed or eliminated (IGBC Guidelines p.3).

The determination of compatibility is based on the proposed federal action, not on individual components of such action. This is apparent from the IGBC guidelines which utilize the consultation process to assist in determining the compatibility of proposed land uses with grizzly bear recovery goals. The Young Dodge Project, as consulted on with the USFWS, is compatible with grizzly bear recovery goals and objectives. Therefore, by meeting the above described objectives, the land uses encompassed by this project do not “compete” within the meaning of the IGBC guidelines.

Further, the Kootenai Forest Plan established guidelines and standards for its programs to provide for a more consistent interpretation and implementation of the Interagency Guidelines on the Kootenai. These guidelines provide broad direction that should be strived for in all management activities but may be altered on the basis of site specific needs as determined in the biological evaluation (Forest Plan, Grizzly Management Situation Guidelines and Augmentation Discussion; Appendix 8-7)

Meeting Objectives 1-4 has been determined to meet the intent of the Interagency Grizzly Bear Guidelines (Buterbaugh 1991) and the Kootenai Forest Plan direction found in Appendix 8. Please refer to TES Table 3-5 for the following summary. Following completion of project activities, grizzly bear core areas would increase and bring the level of core within one percent of IGBC guidelines. OMRD and TMRD would have no net increase either during implementation of the project or following project activities. A large secure area (core habitat) is immediately adjacent to the AA to and can accommodate the needs of any grizzly bears disturbed during project implementation activities, especially those activities near the Cabinet-Yaak Recovery Zone.

In summary the Young Dodge Project is consistent with Management Situation 1 because it meets Objectives 1-4 of the Interagency Grizzly Bear Guidelines (listed in TES Table 3-2), the Kootenai Forest Plan direction found in Appendix 8 (prior to and after the Access Amendment), and the consultation process.

TES Table 3- 5 Kootenai National Forest Grizzly Bear Standards

Grizzly Bear Standards	**Grizzly Bear Analysis Reference**
Evaluate cumulative effects – FP App-8-9 *All proposed timber and fire management activities will be evaluated for their effects on grizzly bears and their habitat. A cumulative effects perspective will be used in the evaluation.*	See Data Sources, Bounds of Analysis, Analysis Framework for discussion on analysis area, and Environmental Consequences, cumulative effects section.
Timing Constraints – FP App 8-10 *Timing Constraints, scheduling, shortened contract periods, Maintenance of movement corridors, Provision of displacement areas, and Access Management will be considered and implemented as needed.*	See Objective 2C – Seasonal Components; See Objective 2B – Movement Corridors; See Objective 1A – Core Areas And See Access Management Plan
Browse Enhancement; Prescribed Burning – FP App 8-11 *Provision for the improvement of bear foods will be incorporated in project design consistent with other considerations.*	See Objective 4 - Bear Food Protection
Open Road Densities FP App 8-11 *Open Road Densities will be reduced. Generally this includes closure of all local roads and an average open road density not to exceed 0.75 mile/section*	See Objective 1 B, C
Attractants – FP App 8-12 *…there will be strict regulation of garbage, pets, and human waste to minimize grizzly/human conflict.*	See Objective 3E
Maintain balance of open and closed roads – FP II-1 # *…(to) ensure grizzly bear security to meet recovery goals…*	See Objective 1
Maintain or enhance habitat for T&E Species – FP II-1 #5 *Including grizzly bear.*	See Objectives 1-4
Maintain diverse age classes of vegetation – FP II-1 #7 *For viable populations of all existing native, vertebrate, wildlife species.*	See Objective 2 A, B, C
Identify and protect important habitat for T &E species – FP II-22-23 *Including grizzly bear*	See Objective 2 and 4

Objective 6. Meet the interim management direction specified in the July 27, 1995, Incidental Take Statement (McMaster 1995).

A. Open Road Density. Manage the density of open roads within the Forest Plan standard. See Objective 1 for details.

B. Open Motorized Trail Density. Do not increase the existing density of open motorized trails in the affected BMU.

None of the action alternatives would have an effect on existing motorized trail density. There are no designated motorized trails within the Young Dodge PSU.

C. Total Motorized Access Route Density (TMARD). Manage all motorized access routes (open and restricted roads and motorized trails) in the affected BMU to avoid a net increase over the existing density.

All **action alternatives** would reduce TMARD in BMU 16 with the physical closure (immovable device – non-gate) of Road 999 and further restriction of portions of 303 and 303J. See objective 1 for details. The no action **Alternative 2**, would not improve the current TMARD for BMU 16.

D. Existing Core Area Size. Manage the amount of Existing Core Area in the affected BMU to avoid a net decrease. See Objective 1.

Additional Analysis for Bears Outside Recovery Zone

Grizzly bear reoccurring use areas outside the recovery zones (BORZ polygons) have been identified (USFS 2009 Grizzly bear access amendment Level 1 meeting) and in their 2011 BO, the USFWS concurred with the existing motorized access conditions for areas of bear occupancy outside the recovery zones. These conditions were determined and established by the 2010 Level One Team (Access Amendment). The access management baseline conditions for the West Kootenai BORZ polygon are displayed below in TES Table 3-6.

TES Table 3-6. Cumulative Baseline Condition of West Kootenai BORZ

BORZ Name	Grizzly Bear Ecosystem	Total Size (acres)	NFS[1] Lands (acres)	Total Linear Miles of Roads on NFS Lands[2]	Total Linear Miles of Open Roads on NFS Lands
West Kootenai	Between SCYE and NCDE	173,122	169,705	615.3	315.9

1. National Forest System Lands. 2.

The 2011 BO includes standards to conserve grizzly bear habitat in BORZ polygons – or areas outside of the recovery zones identified as having recurring grizzly bear use (BA 2010; see also Appendix A1 of BO.). In summary, the standards and *subsequent responses* include:

i. No permanent increases in the total linear miles of "open roads" and "total roads" on National Forest System lands in any individual BORZ area above baseline conditions, except in cases where the Forests lacks discretion to prevent road building across national forest lands due to legal or other obligations (examples include, but are not limited to, ANILCA access claims, identification of RS2477 thoroughfares, etc.). *The Young Dodge Project does not propose any permanent increase in either linear open or total road miles above baseline conditions and is therefore consistent with the 2011 Access Amendment and subsequent BO. Actually, the project* *would result in the reduction of 5.22 linear open miles and 12.25 linear total miles of road therefore improving habitat conditions for any grizzly bears utilizing the West Kootenai BORZ.*

ii. Potential increases in linear miles of open or total roads must be compensated for with in-kind reductions concurrently or prior to such increases. *This standard is not applicable to the Young Dodge Project because no additional linear miles of road, open or restricted are necessary to implement the project. Also see standard one, above. Roads utilized for administrative purposes (e.g. timber hauling, monitoring, etc.) but are not open to the general public are not considered "open," and do not re-categorize linear total road miles to linear open road miles.*

iii. There would be provisions for temporary increases in linear miles for projects but also measures to minimize the impacts of such increases, such as seasonal restrictions of public use to the June 16 – August 31 period. *Any public use, such as personal firewood gathering, subsequent to Young Dodge Project activities, would adhere to agreed upon timing restrictions during the active grizzly bear year season.*

iv. Scheduling considerations in future timber sale planning to avoid concurrent disturbance in multiple adjacent watersheds. *Disturbance of watersheds will be designed and scheduled, temporally and spatially, as such to avoid "activating" adjacent watershed with the project area, defined as the Young Dodge PSU and managed by FS sale administrator(s).*

Disturbance Sources of the Young Dodge Project within the West Kootenai BORZ

The USFWS has identified other factors (within recovery zones, 2011BO) falling under Forest Service jurisdiction that can contribute to the risk of grizzly bear mortality which are also present within the West Kootenai BORZ. These factors are analyzed in the following paragraphs. Bear activity in the Young Dodge PSU portion of this BORZ polygon was previously discussed.

Vegetation Treatments / Helicopter Use

The point source disturbances from timber harvest actions (all treatments buffered by 0.25 miles) may temporarily displace grizzly bears from approximately 17,596 ac during the period of activity that could occur intermittently over several years. However, only a portion of these acres would be unavailable at any given time depending on how the treatment units are divided into timber sales, which would not be active simultaneously (see Standard iv, above). During the helicopter burning of treatment Unit 46, the heli-spot, to be located outside the recovery zone, would temporarily displace bears from approximately 402 acres, though not mutually exclusive from acres affected by the helicopter flight path, which is approximately 9459 acres. The flight path is located both within the CYRZ and West Kootenai BORZ.

Road Use / Timber Hauling

During hauling on restricted roads, an estimated 6440 acres would be "unavailable" to grizzly bears based on utilizing 20 miles of roads for timber hauling purposes at any given time. The range-of-effects of these linear miles of open and total roads were analyzed within the 2011 BO as part of the baseline condition for the West Kootenai BORZ (see TES Table 3-6). Roads utilized for administrative purposes (e.g. timber hauling, monitoring, etc.) but are not open to the general public are not considered "open," and do not re-categorize linear total road miles to linear open road miles. The Young Dodge Project would not affect the benchmarks set for these analysis elements and therefore not increase the risk of grizzly bear mortality within the West Kootenai BORZ.

Livestock Grazing

The proposed project would not change the livestock situation in the West Kootenai BORZ. Livestock are present in this BORZ and recent use has been averaging 180 cow/calf pairs, with 225 pairs allotted. Most importantly, to date, there have been no reports of cattle depredation by grizzly bears within the West Kootenai range allotment. The 2011 BO disclosed, that livestock grazing has been decreasing on the KNF since 1987 with no reports of cattle loss due to grizzly bears. The Young Dodge Project falls within the range-of-effects analyzed by the 2011 BO because the project does not propose any changes to the current allowable cow/calf numbers in the West Kootenai allotment nor expansion of the allotment.

Food Attractants

Food attractants are present in the West Kootenai BORZ on private lands. Area food attractants include; one community garbage collection site with several bear resistant dumpsters, domestic livestock such as cattle, llamas, swine and their associated foods in addition to the range allotment previously disclosed. The food attractant situation would not change with implementation of the proposed action. Additionally, most recently, the KNF has issued a mandatory food storage order (FSO) for all National Forest lands, which will assist in maintaining the positive growth trend for the Cabinet-Yaak grizzly bear population and help mitigate some of the less favorable conditions (e.g. greater potential for human encounters; private lands; miles of linear open road) for grizzly bears outside of the CYRZ. This FSO is automatically included in all permits and contracts issued/administered by the KNF. Similarly, the FSO is applicable to and enforceable within all KNF recreation facilities.

Recreation

Recreation uses on the KNF is another factor disclosed by the 2011 BO that can affect the ability of grizzly bears to live and reproduce within the CYRZ but may apply to the West Kootenai BORZ. The Young Dodge Project does include renovation of a retired fire lookout in BMU 16 and re-route of an existing hiking trail in the West Kootenai BORZ. It also proposes to create a boat launch and parking area along Koocanusa Reservoir to accommodate local residents. None of these recreation facilities are expected to measurably influence the amount of recreation use of the Young Dodge project area. The Young Dodge Project does not propose any changes in motorized trails nor over-the-snow motorized access, both of which were accounted for under the existing conditions and falling within the scope of the 2011 BO analysis for the West Kootenai BORZ.

Habitat Connectivity

The Young Dodge Project would not result in habitat conditions unfavorable to grizzly bear dispersal and general movement across the surrounding landscape. The project maintains high levels (88% of project area defined as Young Dodge PSU) of movement cover based on calculation for large ungulates. The project is consistent with the emphasis placed on this analysis element in the 2011 BO in that movement cover is maintained in all directions, except east. The Young Dodge analysis area is adjacent to Koocanusa Reservoir, which, may or may not impede grizzly bear dispersal to available habitat east toward the Northern Continental Divide Ecosystem.

Cumulative Effects

Summary of the Existing Condition

The Young Dodge PSU has had substantial management activities in the last 15 years (see Table 3-1). These projects treated approximately 63 percent of the PSU with a variety of harvest types; sanitation salvage, clearcut with reserves, shelterwood, and seed tree. Past harvests in the area are listed in Appendix 5 of this document. The harvests of the above projects are now complete and the result of this management is a landscape that is a mosaic of various stages of succession or pulses of high quality food sources. This existing condition is now providing forage opportunities for grizzly bear in the form of huckleberries, herbs, big game, and some whitebark pine.

However, the road construction that typically facilitated timber harvest has contributed negatively to the cumulative effect of management actions on grizzly bears. Roads built for timber harvesting and to access previously non-roaded forests have provided for easier human access, sometimes motorized, which directly (vehicle collision) and indirectly (illegal take; displacement into unsuitable or unavailable habitat where bears find conflict) have resulted in grizzly bear mortalities over time. Open road densities have dramatically dropped in the past several years as a result of closing roads through decisions intended to facilitate grizzly bear recovery. Core habitat has increased across the landscape, providing large core areas from Canada south to the Kootenai River. The habitat parameters incorporated the effects of these past and ongoing activities as displayed in the existing condition (or before the activity).

Effects of Current and Reasonably Foreseeable Actions

The Cumulative Effects Worksheet, located in the Wildlife section of the Project File, contains the detailed analysis of all past, current, and reasonably foreseeable activities listed in Tables 3-1 and 3-2. All activities identified to occur within the Analysis Area that have the potential to affect the grizzly bear are discussed below.

Vegetation Management and Fuels Reduction Activities

The Dodge Mountain Pine Beetle thinning unit (93 acres) is planned for 2012 at the southernmost boundary of the Young Dodge PSU. This timber stand improvement project may contribute to the cumulative effect on the grizzly bear by making these acres temporarily unavailable while being treated. While the project would result in less vegetation to serve as cover for any bear moving through the stand, it may also increase forage opportunities if ground vegetation responds favorably to increased sunlight.

The action alternatives, in combination with other current and reasonably foreseeable vegetation related actions including tree planting, Christmas tree cutting, wreath bough collection, character wood collection (log furniture), and blowdown salvaging (see Table 3-2) would not measurably contribute to cumulative impacts on grizzly bear forage/cover due to the scale of these activities and the scattered occurrence across the Rexford R.D. These projects may result in short-term avoidance of the immediate area while humans are present.

The neighboring Three Rivers Ranger District has proposed the North East Yaak EIS project that is geographically located west of the Young Dodge PSU. The closest activities (2 to 4 air miles) proposed under the North East Yaak project are several miles of road decommissioning and storage, which would have beneficial effects on grizzly bear habitat and other wide-ranging species like lynx, wolves, and wolverine.

Any future precommercial thin projects in the Young Dodge PSU would be analyzed at that time for potential impacts on grizzly bear habitat, such as cover, denning, and forage opportunities. The expected impact of precommercial thinning is similar to other vegetation projects previously mentioned.

Livestock Grazing

Although grazing allotments cover several thousand acres of the PSU, competition between cattle and the grizzly bear for forage is not expected to be an issue. Domestic cattle typically utilize forage areas readily available along roadsides and recently harvested areas that have more gentle slopes whereas grizzlies are more widespread across the landscape and various stages of forest succession depending upon the time of year.

Noxious Weeds

Weed treatment activities would not lead to any adverse effects on grizzlies or their habitat because treatment of weeds would actually benefit forage species important to bears and other mammal species (USDA Forest Service 1997 p30).

Fire Suppression

In the event of a wildfire, construction of fire lines, helispots, and safety zones could potentially result in displacing grizzly bears from site specific areas until the event is contained. Upon completion of wildfire suppression activities, rehabilitation of these same areas can create micro-foraging areas because these sites are seeded for soil stabilization. Wildfire suppression in areas lacking multi-story forest stands would be beneficial to the bear by maintaining cover and summer resting habitat.

Road Management Activities

Road management actions such as road maintenance and administrative use associated with permit administration, data collection, and monitoring of NFS lands are not likely to measurably contribute to the cumulative impact on grizzly foraging habitat along road edges, due to their limited scope (time and space). These activities would not impact denning habitat by avoidance.

Although water restoration projects may temporarily displace grizzlies from a localized area, they typically benefit this species in the long-term by increasing secure cover, providing pulses of foraging when along disinvested road systems, or by simply stabilizing soils where certain habitat components can remain available (see Water and Transportation Sections).

Recreation Maintenance

Actions such as site or trail maintenance and administrative use associated with permit administration, data collection, and monitoring of NFS facilities are not likely to measurably affect grizzlies and their ungulate prey species. These species will typically simply avoid the disturbance area until human activities terminate, which usually comprises of a few hours. Also refer to road maintenance activities, above.

Special Uses

There are areas previously impacted by special use permits such as gravel pits, building sites (fire station), fish weir, utility corridors, private land access routes, and outfitter/guide trails that will continue to be present and utilized. The ground disturbance on resources such as grizzly bear foraging or denning habitat, where present, have been included under the existing condition and would have no additional impacts due to lack of expansion.

Public Use

Other public uses such as wildlife viewing, berry picking, firewood gathering, camping, snowmobiling etc. have negligible impacts on grizzly bears given their limited scope (time and space) and largely non-consumptive nature. Infrastructure, such as roads and campgrounds, that facilitate these activities have already been accounted for under the existing condition.

Ongoing hunting activities are regulated by the MFWP. The Forest Service influences hunter access through road management. The Forest Service also identifies areas where physically-challenged hunters are allowed to drive restricted roads. This program currently includes 2 roads (approximately 9 miles) in the Young Dodge PSU.

Hunting activities within the PSU will cumulatively contribute to minor short-term effects (during the general hunting season) to habitat security. Effects from hunting vary with activity levels and can include short-term disturbance. Mortality risk to the listed species like the grizzly bear and lynx, is increased through hunting. The level of hunting within the Analysis Area is not expected to significantly change due to the action alternatives, since no new road construction will occur.

Private Property

If private land owners build their estimated 12.5 miles of road and harvest an estimated 25 acres, there would still likely be little to no impact on grizzly bears because the private lands in the PSU are outside of quality habitat as related to the amount of human use (disturbance) in these areas.

Other Lands

The state of Montana is proposing to thin 50 acres immediately adjacent to NFS lands in T37N, R28W. Disturbance and vegetation effects on these acres would be similar to those described under vegetation treatments occurring on NFS lands.

Summary of Cumulative Effects

The action alternatives of this project were designed to meet grizzly bear standards and guidelines. Cumulatively, the potential exists to displace grizzly bears to core areas, and other areas not affected by the activities, but these projects are not expected to contribute cumulatively to bear mortalities given that no new roads will be constructed within the PSU and the project's compliance with the 2011 BO on Forest Plan Amendments for Motorized Access Management within the Selkirk and Cabinet-Yaak Recovery Zones on the Kootenai, Idaho Panhandle, and Lolo National Forests. Additionally, the action alternatives, in combination with the baseline conditions and reasonably foreseeable projects (see earlier list) would improve the overall recovery zone core from 53 to 54 percent.

Regulatory Consistency

Forest Plan

- The project complies with Forest Plan direction on T&E species that applies to the grizzly bear (FP II-1 #s 5, II-22)

- All alternatives are consistent with Forest Plan direction to maintain diverse age classes of vegetation for viable populations (FP II-1 #7) by maintaining appropriate amounts and quality of suitable habitat in order to maintain species viability based on best science. By meeting this FP direction, the project maintains suitable habitat for forage / prey species of the bear.

Endangered Species Act

- The project is consistent with the Endangered Species Act as evidenced through consultation with the FWS and receipt of concurrence (3/9/2012) and by compliance with the 2011 BO on Forest Plan Amendments for Motorized Access Management within the Selkirk and Cabinet-Yaak Recovery Zones on the Kootenai, Idaho Panhandle, and Lolo National Forests.

National Forest Management Act

- The project complies with the National Forest System Land and Resource Management Planning rule of November 9, 2000, as amended by meeting Kootenai National Forest Land Management Plan direction for a variety of vegetation age classes and through the utilization of best science for potential impacts on this habitat resource.

Statement of Findings

The **Young Dodge Project** *may affect, is likely to adversely affect the grizzly bear*. This determination is based on: 1) while the Young Dodge Project activities fall within the range-of-effects analyzed in the programmatic BO for the 2011 Forest Plan Amendments for Motorized Access Management within the Selkirk and Cabinet-Yaak Grizzly Bear Recovery Zones and therefore, in itself, is not likely to result in the loss of grizzly bears from the CYRZ or West Kootenai BORZ, the existing condition of BMU 16 falls short of "benchmarks" considered unlikely to have adverse effects on grizzly bears; 2) helicopter use associated with the Young Dodge Project is consistent with the management strategies found in the Guide to Effects Analysis of Helicopter Use in Grizzly Bear Habitat (2009) that are not likely to adversely affect grizzly bears; helicopter activities would not prohibit bears from using the area during any period of biological importance such as breeding, late fall foraging (hyperphagia), or denning; 3) the Young Dodge Project does not change the livestock management of the West Kootenai BORZ; 4) project activities would not result in an increase in food attractants and would comply with the 2011 KNF Food Storage Order; 5) the project would not result in measurable increases in recreation use of the CYRZ or West Kootenai BORZ based on limited improvements; and 6) the project does not involve changes to any type of mining activities within the CYRZ or West Kootenai BORZ and would not result in habitat fragmentation between grizzly bear recovery zones CYRZ and NCDE.

CANADA LYNX

Data Sources, Methods, Assumptions, Bounds of Analysis

Lynx population ecology, biology, and habitat description and relationships are described in Ruggiero et al (2000) and Ruediger et al (2000). That information is incorporated by reference. In addition, the final lynx listing rule (Clark 2000) gives population and habitat status on a national scale. The most recent lynx distinct population segment status is found in the Biological Opinion on the effects of the Northern Rocky Mountains Lynx Amendment (USFWS 2007c). Lynx occurrence data comes from Forest historical records (NRIS Wildlife), and other agencies (MNHP, MFWP, and USFWS).

The Final EIS for the Northern Rockies Lynx Management Direction (Lynx Amendment) was completed in March 2007 with the ROD signed March 23, 2007. This decision amends the 1987 Kootenai Forest Plan by providing lynx habitat management objectives, standards and guidelines. The decision replaces the interim application of the Lynx Conservation Assessment and Strategy (LCAS). The direction provided in the Lynx Amendment is applied to lynx habitat at the Lynx Analysis Unit (LAU) scale. In compliance with the LCAS the KNF delineated 47 LAUs that approximate a lynx home range size. Forest-wide lynx habitat was mapped in compliance with LCAS project planning Standard #1 and that map will be updated to reflect the lynx habitat terminology from the Lynx Amendment.

On February 28, 2008, the USDI Fish and Wildlife Service issued their proposed rule in the Federal Register (Vol. 73, No. 40; pp10860-10896) to revise the critical habitat designation for the lynx in the United States. Then, on February 25, 2009, the USFWS issued their final rule in the Federal Register (Vol. 74, No. 36; pp8615-8702) to revise the critical habitat designation for the lynx in the United States. Based on these maps, the Young Dodge PSU falls within Subunit #6 of the Northern Rocky Mountains (NRM) Critical Habitat Unit #3. In addition to the critical habitat delineation, the proposal of the Fish and Wildlife Service also identified the primary constituent element for lynx, defined as: "boreal forest landscapes supporting a mosaic of differing successional forest stages," containing the following sub-elements; snowshoe hares and their preferred habitat, adequate winter snow conditions, denning habitat with abundant coarse woody debris, and 'matrix' habitat which facilitates lynx movement and dispersal and connects areas of suitable habitat.

The effects analysis evaluates whether or not standards and guidelines established in the Lynx Amendment will be met. These standards and guidelines were developed to address the threats to lynx (NRMLD ROD, p. 28) and were found to contribute to the conservation and recovery for lynx (NRLMD ROD p.7). Lynx habitat in impacted LAUs was mapped using the timber stand database version of the Kootenai National Forest model. Connectivity was evaluated by visually examining lynx habitat and past management activities to determine possible movement areas and potential areas where lynx travel may be hindered. Ridge lines and draws were considered high value movement areas.

The scale for direct, indirect, and cumulative effects analysis is the impacted LAU(s) and adjacent LAUs for connectivity effects. An LAU is the size of a lynx home range. The management direction is the NRMLD is to be applied to an LAU, based on the concept that if the standards and guidelines are met in the home range t hen the action would contribute to the conservation and recovery of lynx. For this project, the activities occur in one LAU (14101).

Affected Environment/Existing Condition

On March 24, 2000 the U.S. Fish and Wildlife Service listed the contiguous U.S. distinct population segment of the Canada lynx as Threatened (Clark 2000). National population and habitat status descriptions in that document are incorporated by reference. There are two occurrences (2001 and one undated) of lynx found in the historical records that are within the Young Dodge PSU.

Currently, the Young Dodge LAU (14101) meets the Lynx Amendment standards (USDA Forest Service 2007). For LAU map please see MAP 3-11.

Lynx use a variety of forest ages, types and structural stages. The NRLMD is intended to provide a mosaic of habitats in certain structural stages. Lynx habitat in the impacted LAU was modeled in terms consistent with the lynx amendment. TES Table 3-8 displays the current lynx habitat conditions in the PSU.

TES Table 3- 5 Lynx Habitat by LAU in the Young Dodge PSU

LAU	Total Lynx Habitat In LAU Acres	Habitat Acres (Stand initiation stage) (%) \1	Habitat Changed to a Stand Initiation Structural Stage Over past 10 years by timber management with regeneration harvests Acres (%) \2	Number of adjacent LAUs that exceed 30% lynx habitat in stand initiation structural stage
14101	18,134	7.1	2.9	0

\1 These acres are lynx habitat that currently do not provide sufficient vegetation quantity or quality (height) to be used by snowshoe hare and lynx. No additional regeneration harvest allowed if more than 30% of lynx habitat in an LAU is in a stand initiation structural stage that does not provide winter snowshoe hare habitat.

\2 Percent is the percent of total LAU acres that provide lynx habitat. No more than 15% of lynx habitat on NFS lands in an LAU may be changed by regeneration harvest in a 10 year period.

There are no identified linkage corridors (USDA Forest Service 2004 Figure 1-1; USDA Lynx Taskforce 1997) in the Young Dodge PSU or potentially impacted LAUs or adjacent LAUs.

Environmental Consequences

Direct and Indirect Effects

Objectives, Standards and Guidelines applicable to ALL management projects in lynx habitat

Objective ALL 01: Maintain or restore lynx habitat connectivity in and between LAUs and in linkage areas.

The Young Dodge PSU project would serve to re-initiate several areas of general lynx habitat no longer providing foraging opportunities. Stand re-initiation, while impacting movement or travel (matrix) habitat in the short-term would greatly benefit snowshoe hares 5 to 30 years following management treatments by creating pulses of foraging habitat where it is currently sparse to non-existent. None of the alternatives would affect the ability of the lynx to move in and between LAUs or established linkage areas because riparian areas would not be harvested and these can be used to facilitate lynx movement.

Standard ALL S1: New or expanded permanent development and vegetation management projects must maintain habitat connectivity in an LAU and/or linkage area.

This standard is met because there are no permanent developments within the associated LAU. Habitat connectivity within the impacted LAUs is very good except for upper Young Creek, where cover is restricted to narrow corridors due to the effects of the 2000 wildfires and post-fire harvest activities. Connectivity with other LAUs is mostly good to the south and west. This LAU also borders Canada where habitat connectivity is generally good. Lynx connectivity would be maintained because no activities would occur in riparian areas which facilitate lynx movement.

There are no identified linkage corridors (USDA Forest Service 2004: Figure 1-1; KNF Lynx Taskforce 1997: 6) in or adjacent to the Planning sub-unit or potentially impacted LAUs.

Guideline ALL G1: Methods to avoid or reduce effects on lynx should be used when constructing or reconstructing highways or forest highways across federal land. Methods could include fencing, underpasses, or overpasses.

No highway or Forest road construction or reconstruction activities are planned, therefore this guideline does not apply.

Standard LAU S1: Changes in LAU boundaries shall be based on site-specific habitat information and after review by the Forest Service Regional Office.

No changes in LAU boundaries are proposed, therefore this standard does not apply.

Objectives, Standards and Guidelines applicable to vegetation management projects in lynx habitat within LAUs

Standard VEG S1: If more than 30 percent of the lynx habitat in the LAU is currently in a stand initiation structural stage that does not yet provide winter snowshoe hare habitat, no additional habitat may be regenerated by vegetation management projects. Exception: Fuel treatment projects in the WUI, as defined by HFRA, subject to the following limitation – fuel treatment projects in the WUI that do not meet Standards VEG S1, S2, S5 and S6 shall occur on no more that 6 percent (cumulatively) of lynx habitat on each National Forest. In addition, fuel treatment projects may not result in more than three adjacent LAUs exceeding this standard. For fuel treatment projects in the WUI, see guideline VEG G10.

See TES Table 3-9 for how the impacted LAU meets or exceeds the 30% standard.

TES Table 3-6 Percent Habitat Not Providing Winter Snowshoe Hare Habitat Within Impacted LAUs

	Existing Condition Alternative 2	Alternative 1	Alternative 1M	Alternative 3
Percent habitat directly affected by proposed treatment activities in LAU 140101	n/a	12.7	6.4	11
Cumulative (%) not providing winter snowshoe hare habitat following proposed treatment activities in LAU 140101	7.1	19.8	12.5	18.1

The proposed activities would increase the existing level of lynx habitat not providing snowshoe hare winter habitat in one LAU. In LAU 14101, 2310 acres would be converted to unsuitable for winter snowshoe hare habitat by Alternative 1, 982 acres by Alternative 1M, and 1998 acres would be converted by Alternative 3. Cumulatively, all action alternatives would have less than 30 percent of lynx habitat in a stand initiation structural stage that does not yet provide winter snowshoe hare habitat. Within the next 15 or so years, these forests would grow and provide winter snowshoe hare habitat; thereby keeping the desired mosaic across the landscape.

Standard VEG S2: Timber management projects shall not regenerate more than 15 percent of lynx habitat on NFS lands within a LAU within a 10-year period. The same exception described in standard VEG 01 for fuels projects in the WUI applies to this standard.

This standard is met in the affected LAU. TES Table 3-10 provides a comparison, by Alternative, of how the impacted LAU complies with this standard.

TES Table 3-7 Cumulative Regeneration Harvest in Lynx Habitat in the Last 10 years in Impacted LAU

	Existing Condition Alternative 2	Alternative 1	Alternative 1M	Alternative 3
Percent habitat directly affected by proposed treatment activities in LAU 140101	n/a	12.7	6.4	11
Cumulative (%) not providing winter snowshoe hare habitat following proposed treatment activities in LAU 140101	2.9	15.0	9.3	13.9

*This standard is met for Alternative 1 by deferring the prescribed burn scheduled for treatment Unit 46 until after 2013 when additional lynx habitat becomes available.

Standard VEG S5: Pre-commercial thinning projects that reduce snowshoe hare habitat may occur from the stand initiation structural stage until the stands no longer provide winter snowshoe hare habitat only:

1. *Within 200 feet of administrative sites, dwellings, or outbuilding; or*
2. *For research studies or genetic tree tests evaluating genetically improved reforestation stock; or*
3. *Based on new information that is peer reviewed and accepted by the regional level of the Forest Service and state level FWS, where a written determination states:*
4. *that a project is not likely to adversely affect lynx; or*

5. *that a project is likely to have short-term adverse effects on lynx or its habitat, but would result in long-term benefits to lynx and its habitat; or*

6. *For conifer removal in aspen, or daylight thinning around individual aspen trees, where aspen is in decline; or*

7. *For daylight thinning of planted rust-resistant white pine where 80% of the winter snowshoe hare habitat is retained; or*

8. *To restore whitebark pine.*

Exceptions 2 through 6 shall only be utilized in LAUs where standard VEG S1 is met.

This standard does not apply because no pre-commercial thinning is proposed in lynx habitat.

Standard VEG S6: Vegetation management projects that reduce snowshoe hare habitat in multi-story mature or late-successional forests may occur only:

1. *Within 200 feet of administrative sites, dwellings, outbuildings, recreation sites, and special use permit improvements, including infrastructure within permitted ski area boundaries; or*

2. *For research studies or genetic tests evaluating genetically improved reforestation stock; or*

3. *For incidental removal during salvage harvest (e.g. removal due to location of skid trails).*

Exceptions 2 and 3 shall only be utilized in LAUs where standard VEG S1 is met.

All action alternatives would reduce the amount of lynx "matrix" or travel habitat with LAU 14101 as shown in TES Table 3-11, below. The Young Dodge proposed treatment units within the LAU were reviewed for stand conditions with respect to Vegetation Standard 6. This standard prohibits reduction of snowshoe hare habitat within multi-story mature and late-successional forest. The purpose of this standard is to assist in maintaining lynx winter foraging habitat considered by lynx biologists to be critical in perpetuating viable lynx populations.

Each treatment unit was photographed (with exception to Units 46 and 118, which were visited but not photographed) for the Project File and were categorized as either contributing to lynx winter foraging habitat and should be dropped from treatment activities, multi-story stands in which timber harvesting would improve winter foraging in the future (~15 years), non-lynx habitat within an LAU, or as simply general lynx habitat where treatments can occur when meeting Vegetation Standards 1 and 2. These treatment units were re-evaluated in the summer of 2009 using the Region 1 Draft Horizontal Cover Guidance of June 5, 2008 and professional judgment. The units were ground verified and the vegetation in many of the proposed units did not provide the multi-story, dense horizontal cover required for snowshoe hare habitat. However, a total of 116 acres were found to meet the horizontal cover standard (48% summer) and were dropped from the Young Dodge project in order to comply with VEG S6 of the Lynx Amendment. Still other acres (approximately 338) were dropped due to stream management zones, data base accuracy, economics, and access issues. Cumulatively, these recently dropped acres contribute to maintaining either multi-story foraging habitat or matrix habitat for the lynx, providing for unimpeded movement across the landscape.

After field review of the proposed treatment units, all of the units contributing to Alternatives 1, 1M, and 3, within lynx habitat, were approved for implementation based on the rationales listed above with the exception of Unit 36, and a portion of Units 17 and 40. Two units or portions thereof, including portions of Unit 17 and 46, were determined to provide ‘marginal’ winter foraging habitat that could be enhanced by treating the canopy and prescribed burned to provide long-term benefits, both cover and foraging, for lynx.

A list of the proposed treatment units located within the Young Dodge LAU, their associated photo identification numbers, and their assigned management status related to lynx habitat standard Vegetation Standard 6, is available in the Project File for this analysis. Lynx Analysis Unit 14101 meets Veg S1 (30%) also, as shown in TES Table 3-9, above.

TES Table 3- 8 Multi-Story Mature or Late Succession Forest Snowshoe Hare Habitat Impact Summary

ALT #	LAU #	Acres of multi-story mature and late successional forests	Acres of vegetation management	Exception(s) applied	Is standard VEG S1 being met (Y/N)
1	14101	11202	2310	n/a	Y
1M	14101	11202	982	n/a*	Y
2	14101	11202	none	n/a	Y
3	14101	11202	1998	n/a	Y

*Note: Timber harvest is allowed in areas that have potential to improve winter snowshoe hare habitat but presently have poorly developed understories that lack dense horizontal cover (e.g. uneven-aged management systems could be used to create openings where there is little understory so that new forage can grow).

Objectives VEG 01, 02, 03, and 04: All action alternatives utilize timber harvest and prescribed fire in general lynx “matrix” habitat. Given the current condition of these stands having either poorly developed understories or having been previously harvested and having little lodgepole pine component, managing these stands would provide hundreds of acres for lynx foraging in approximately 10 to 15 years. The mosaic designs of the proposed treatment units, as well as the size, would also assist in creating large blocks of forest that would provide future interior habitat for connectivity, and foraging habitat better mimicking natural landscape patterns.

Guidelines VEG G1, G4, G5, G10 and G11

All action alternatives comply with VEG G1 as described in the objectives above. Likewise, all action alternatives comply with VEG G4 since prescribed fire would only be used to reduce fuel loading and prepare the forest floor for planting and natural regeneration. Alternatives 1, 1M, and 3 comply with VEG G5 because multiple acres (over 35%) would remain in the LAU suitable for the alternative prey species, red squirrel. Both VEG G10 and 11 are met in that fuel treatment projects in the WUI that overlap with LAU 14101 meet Vegetation Standards 1, 2, 5, and 6 and VEG 11 because there is no lack of lynx denning habitat within the LAU.

Objectives and Guidelines applicable to livestock management projects in lynx habitat within LAUs

Objective GRAZ 01:

The project does not include any changes in current livestock management activities. This objective does not apply.

Guidelines GRAZ G1, G4, G5, G10 and G11

The project does not include any changes in current livestock management activities. This objective does not apply.

Objectives and Guidelines applicable to human use projects in lynx habitat within LAUs

Objectives HU 01, 02, 03, 04, 05, and 06:

Objectives HU 1 and 3 through 6 are not applicable to this project.

Both Alternatives 1, 1M, and 3 would comply with Objective HU 2 because the relocation of the Robinson Mountain connection trail #238 (South Fork Young Creek trail) would result in no net loss of lynx habitat nor would a four foot trail prism impact habitat connectivity. Similarly, both the Young Bay boat ramp/parking area and the Robinson Lookout renovation are either outside of lynx habitat or would not involve the alteration of lynx habitat. There would be no measurable impacts on lynx habitat from the renewal of existing special uses and outfitter and guide permits in the Young Dodge PSU because the facilities, utility corridors, or use areas are already established and their impacts (also to cover, road densities, special areas etc.) were accounted for under the existing condition. There are also no proposals for expansion of these permits under this project.

Guidelines HU G1 through G12:

Guidelines HU G1 through G12 are not applicable to this project.

Objectives, standards, and guidelines applicable to ALL projects in linkage areas, subject to existing rights.

Objective LINK 01:

There are no areas of intermingled land ownerships within the LAU; therefore this objective does not apply.

Standard LINK S1: When highway or forest highway construction or reconstruction is proposed in linkage areas, identify potential highway crossings.

The project does not involve construction or reconstruction of a highway or forest road; therefore this standard does not apply.

Guidelines LINK G1 and G2:

The project does not involve the sale or exchange of NFS lands; therefore guideline LINK G1 does not apply. Neither does it involve livestock grazing in shrub-steppe habitats, so guideline LINK G2 does not apply.

Cumulative Effects

Summary of the Existing Condition

The existing condition of Canada lynx habitat has been affected by past management actions and natural occurrences similar to those effects on grizzly bear and wolf habitat. Vegetation altering events, whether man-caused or naturally occurring have been largely beneficial for lynx in that they have provided cycles of foraging habitat scattered fairly evenly across the landscape and intermingled with other habitat elements necessary for lynx survival. But, like with the grizzly bear and gray wolf, roads and trails constructed to facilitate timber harvesting and other forest management activities have made it easier for humans to access habitats that were once more remote within the PSU. This situation is evident by the amount of secure habitat demonstrated under MIS elk.

Effects of Current and Reasonably Foreseeable Actions

The Cumulative Effects Worksheet, located in the Wildlife section of the Project File, contains the detailed analysis of all past, current, and reasonably foreseeable activities listed in Tables 3-1 and 3-2. All activities identified to occur within the Analysis Area that have the potential to affect the lynx are discussed below.

Vegetation Management and Fuels Reduction Activities

The Dodge Mountain Pine Beetle thinning unit (93 acres) is planned for 2012 at the southernmost boundary of the Young Dodge PSU. This timber stand improvement project would not contribute to the cumulative effect on lynx or their habitat because it is outside of any lynx analysis unit and suitable habitat.

The action alternatives, in combination with other current and reasonably foreseeable vegetation related actions including tree planting, Christmas tree cutting, wreath bough collection, character wood collection (log furniture), and blowdown salvaging would not measurably contribute to cumulative impacts on lynx and hare forage/cover due to the scale of these activities and the scattered occurrence across the Rexford R.D..

Any precommercial thin projects in the Young Dodge LAU or adjacent LAUs would be analyzed for their compliance to the NRLMD in order to avoid any cumulative effects on lynx habitat within these LAUs and subsequently tracked as agreed upon at the Forest level when occurring within the WUI.

Livestock Grazing

Although grazing allotments cover several thousand acres of the PSU, competition between cattle and the snowshoe hare as the primary prey species for forage is not expected to be an issue. Domestic cattle typically utilize forage areas readily available along roadsides and recently harvested areas that have more gentle slopes whereas snowshoe hares are more widespread across the landscape and heavily within thick stands of conifer regenerations.

Noxious Weeds

Weed treatment activities would not lead to any adverse effects on lynx prey species or their habitat because treatment of weeds would actually benefit forage species important to hares and other small mammal species (USDA Forest Service 1997 p30).

Fire Suppression

In the event of a wildfire, construction of fire lines, helispots, and safety zones could potentially result in displacing lynx and their prey from site specific areas until the event is contained. Upon completion of wildfire suppression activities, rehabilitation of these same areas can create micro-foraging areas because these sites are seeded for soil stabilization. Wildfire suppression in areas lacking multi-story forest stands would be beneficial to lynx by maintaining winter forage and denning habitat.

Road Management Activities

Road management actions such as road maintenance and administrative use associated with permit administration, data collection, and monitoring of NFS lands are not likely to measurably contribute to the cumulative impact on lynx/hare foraging habitat along road edges, due to their limited scope (time and space). These activities would not impact winter foraging or lynx denning habitat by avoidance.

Although water restoration projects may temporarily displace lynx and hares from a localized area, they typically benefit these species in the long-term by increasing security, providing pulses of foraging when along disinvested road systems, or by simply stabilizing soils where certain habitat components can remain available (see Water and Transportation Sections).

Recreation Maintenance

Actions such as road or trail maintenance and administrative use associated with permit administration, data collection, and monitoring of NFS lands are not likely to measurably affect lynx and their prey species. These species will typically simply avoid the disturbance area until human activities terminate, which usually comprises of a few hours. Also refer to road maintenance activities, above.

Special Uses

There are areas previously impacted by special use permits such as gravel pits, building sites (fire station), fish weir, utility corridors, private land access routes, and outfitter/guide trails that will continue to be present and utilized. The ground disturbance on resources such as lynx foraging or denning habitat, where present, have been included under the existing condition and would have no additional impacts due to lack of expansion.

Public Use

Other public uses such as wildlife viewing, berry picking, firewood gathering, camping, snowmobiling etc. have negligible impacts on lynx and hares given their limited scope (time and space) and largely non-consumptive nature. Infrastructure, such as roads and campgrounds, that facilitate these activities have already been accounted for under the existing condition.

Private Property

If private land owners build their estimated 12.5 miles of road and harvest an estimated 25 acres, there would still likely be little to no impact on lynx because the private lands in the PSU are outside of suitable lynx habitat.

Other Lands

The state of Montana is proposing to thin 50 acres immediately adjacent to NFS lands in T37N, R28W, however these lands are outside of suitable lynx habitat.

Summary of Cumulative Effects

Timber sales and other management projects, such as salvaging, road work, and fuels reductions, listed in the Tables 3-1 and 3-2 may have temporary effects on lynx and associated prey species. These effects may include avoidance of activity areas and alteration of matrix (travel). Although these effects may occur, they are not expected to result in lower prey populations due to the poorly developed habitat conditions currently existing where vegetation treatments are proposed. Contrarily, vegetation management activities can have beneficial effects, once management activities cease, by providing additional and or reconditioned areas lynx foraging (hare habitat).

The temporal occurrence of forest uses such as summer activities (camping, hiking, and berry picking) versus fall (hunting and firewood cutting) or winter (skiing and snowmobiling) activities, and the scheduling of management actions to avoid key time periods (denning) when lynx may be more sensitive to human disturbances, allow for the avoidance of measurable cumulative impacts to lynx and primary prey species. There may be some situations where isolated or localized cumulative effects may occur, due to an overlap of forest activities, but these situations are typically short in duration, and do not persist through the lifecycle of the species, either temporally or spatially.

Regulatory Consistency

Forest Plan

- The project complies with Forest Plan direction on T&E species that applies to the Lynx (FP II-1 #7 II-22) and the Lynx Amendment by meeting vegetation standards for habitat elements designated critical for perpetuation of the species as disclosed in the analysis.

- All alternatives are consistent with Forest Plan direction to maintain diverse age classes of vegetation for viable populations (FP II-1 #7) by maintaining appropriate amounts and quality of suitable habitat in order to maintain species viability based on best science. By meeting this FP direction, the project maintains suitable habitat for primary prey species of the Canada lynx.

Endangered Species Act

- The project is consistent with the Endangered Species Act as evidenced through consultation with the FWS and receipt of concurrence (March 9, 2012).

National Forest Management Act

- The project complies with the National Forest System Land and Resource Management Planning rule of November 9, 2000, as amended by meeting Kootenai National Forest Land Management Plan direction for a variety of vegetation age classes and through the utilization of best science for potential impacts on this habitat resource.

Statement of Findings

Alternative 2, due to a lack of action, will have no effect on lynx.

Alternatives 1, 1M, and 3 *may affect, but are not likely to adversely affect the lynx*. Likewise, Alternatives 1, 1M, and 3 *may affect, but are not likely to adversely affect designated critical lynx habitat*. This determination is based on the fact that: 1) the Young Dodge EIS complies with all standards, guidelines, and objectives of the Northern Rockies Lynx Management Direction Record of Decision and its activities fall within the scope of those analyzed in the subsequent Biological Opinion (2007), more specifically, the project would not result in habitat conditions that would cumulatively contribute to the low level of species loss estimated by the 2007 BO2) these projects do not involve any activities that many result in increased areas of snow compaction, nor permanent loss of lynx habitat; and 3) although this project would temporarily affect the primary constituent sub-element, 'matrix' habitat, it meets ALL S1 standards, therefore maintaining habitat connectivity within and between associated LAUs. Additionally, the project would not remove or significantly alter any of the other primary constituent sub-elements including: space; nutritional or physiological requirements; cover or shelter; breeding or rearing sites; or habitats protected from disturbance that represent historic, geographical, and ecological distribution of the species.

MIGRATORY BIRDS

INTRODUCTION

Executive Order #13186 (January 10, 2001): “Responsibilities of Federal Agencies to Protect Migratory Birds” was issued by President Bill Clinton in furtherance of the purposes of the Migratory Bird Treaty Act, the Bald and Golden Eagle Protection Acts, the Fish and Wildlife Coordination Act, the Endangered Species Act, and the National Environmental Policy Act. This order requires including effects of federal actions on migratory birds as part of the environmental analysis process. On January 17, 2001, the USDA Forest Service and the USDI Fish and Wildlife Service signed a Memorandum of Understanding to complement the Executive Order.

The National Forest Management Act (NFMA) (36 CFR 219.27) requires that Forest plans and management prescriptions (where appropriate and to the extent practicable) shall “preserve and enhance the diversity of plant and animal communities, including endemic and desirable naturalized plant and animal species, so that it is at least as great as that which could be expected in a natural forest." Furthermore, FP directs that, "Fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native vertebrate species in the planning area."

Affected Environment

Neotropical migratory birds are those bird species that migrate to more northerly latitudes to breed on the Kootenai National Forest each summer. Come fall, these species migrate south to spend the winter months. Of the approximately 205 bird species known to occur on the Forest as breeders, migrants, winter visitors, or transients, about 75 to 85 species could be classified as Neotropical migratory land birds (Al Bratkovich, Libby District Wildlife Biologist and Forest Land Bird Monitoring Program Coordinator, pers. comm. in November 2007).

Environmental Consequences

Responses of migrant birds to timber harvest and burning (prescribed or wildfire) depends upon their individual habitat preferences and needs. Regeneration harvest removes forest cover used by some species (e.g. brown creeper, golden-crowned kinglet, hermit thrush) and at the same time creates grass, forbs, and shrub habitat used by other bird species (e.g. American kestrel, calliope hummingbird, chipping sparrow). This activity also produces “edge” habitat that still other bird species use (e.g. dark-eyed junco, western tananger, Townsend’s warbler). Edge habitat is often similar to forest stands created with intermediate harvest (e.g. commercial thinning, shelterwood). Species using edge are often found in these stands, so this management practice may provide additional habitat for these species (Hutto and Young 1999).

Effects Common to All Alternatives

Management indicator species have been designated for the Kootenai National Forest (See the discussion of MIS above; old growth analysis; pileated woodpecker; and forest cover discussion under the elk). These MIS species represent the habitat needs for migratory birds. Because habitat for MIS species is being maintained, it is assumed that sufficient habitat and populations of Neotropical migratory land birds are also being maintained.

Cumulative Effects

Please refer to the discussions for various species or resources mentioned above; specifically to the cumulative effects on old growth, snags, and general forest cover where habitat elements required by Neotropical and resident birds has been altered, resulting in both beneficial and harmful effects.

Regulatory Framework and Consistency

There are no specific goals or standards for migratory land birds in the Kootenai Forest plan. It does contain the goal to: "Maintain diverse age classes of vegetation for viable populations of all existing native, vertebrate, wildlife species," (FP Vol 1 II-1 Goal #7). All alternatives are consistent with the Kootenai Forest plan, as a wide range of successional habitats would be available (See Vegetation and MIS sections). The alternatives are in compliance with the Executive Order titled "Responsibilities of Federal Agencies to Protect Migratory Birds"by protecting known nest sites and special habitat (e.g. riparian habitats, old growth etc.). In addition, as habitat for MIS species is being maintained in the Young Dodge PSU, and across the Kootenai National Forest, their habitat contributes to the maintenance of habitat and populations of Neotropical migratory bird species.

RECREATION

INTRODUCTION

Recreation use on the KNF and within the Decision Area has changed over time, due to various factors. The primary factor is the increased ability to access the forest and other areas with motorized transportation over the existing open road system. Another change has been the shift in demographics of forest visitors. These changes have shifted the recreational use patterns and how visitors view the forest and what it offers.

Recreational opportunities in the Decision Area reflect both its roaded and unroaded character, as well as the easy access to numerous streams and Koocanusa Reservoir.

The majority of recreational use occurs during peak summer months and is concentrated along undeveloped camping sites near Koocanusa Reservoir and within the Robinson Mountain area. Use of these dispersed recreational sites within the Decision Area is moderate throughout the year. Motorized access to other roaded portions of the Decision Area over an established system of roads within the Young Creek and Dodge Creek drainages encourages forest visitors to explore the area through hiking and berry picking, as well as hunting and fishing in the streams and upper alpine lakes. Approximately 75 miles of Forest Service roads open yearlong and 4 miles of seasonally open roads provide for a variety of motorized recreational experiences within the Decision Area. The Decision Area also has approximately 11 miles of maintained hiking trails that provide access to a former Robinson Mountain lookout cabin.

EXISTING CONDITIONS AND TRENDS

The Decision Area offers unique recreational opportunities ranging from dispersed camping along area streams and Koocanusa Reservoir, to hiking on a maintained, inventoried trail or on restricted roadways. One of the unique areas is the high alpine Lake Geneva area. Primary access to the Decision Area occurs north from Koocanusa Bridge, along County Road 474, then via secondary roads, Dodge Creek Road 470 and Young Creek Road 7202. Both motorized and non-motorized recreational use of the Decision Area is increasing. Private lands in the West Kootenai area have undergone significant development in the last five years, where additional homes and residents are living year-round.

Although there are limited developed recreational sites, like the Robinson Mountain lookout cabin; there are a number of dispersed recreational sites scattered along open roadways, primarily near streams. These sites generally consist of a rock fire-ring and parking area. The largest concentration of these sites occurs along the lower and middle reaches of Dodge and Young Creeks, and at various sites along the shoreline of Koocanusa Reservoir. Boating access and boat mooring generally are associated with Young Creek Bay. Typically during the early spring, many local boat owners launch their boats at the nearest boat ramp on the reservoir, Rexford Bench; then moor their boats for the remainder of the season in Young Creek Bay. During the peak summer season there may be as many as 15 to 20 boats tied up along the shoreline or tied to private floating docks. Various individuals have expressed a need for improved boating access on western side of Koocanusa Reservoir. The construction of a boat ramp in the West Kootenai area within close proximity of the private land would meet this request.

This concern was addressed and identified within Alternative 1. The proposed boat launch site and associated actions would respond to Purpose and Need statement E and relate to Strategy 8 as identified in Chapter 1.

The 11 miles of maintained hiking trails provide access into the Robinson Mountain Inventoried Roadless Area. These trails include: Geneva Lake #22, Young Creek #58, and Robinson Mountain #59. Another non-motorized trail, Clingback #433 is located on the southern boundary of the Decision Area. Use of these trails is generally light-to-moderate throughout the peak summer months; the majority of use occurs on the Lake Geneva Trail #22. This trail provides easy access to Lake Geneva and Robinson Lookout cabin. Currently portions of Robinson Mountain Trail #59 utilize the roadbed of Road #999, before the Roadless Area boundary. The District is evaluating reconnecting a short segment of South Fork of Young Creek Trail #238 to replace that portion of Road #999. This reconnection would shorten the hiking distance to the lookout by over 1.5 miles.

Trail reconstruction and improved access to Robinson Mountain lookout would respond to Purpose and Need statement E and relates to Strategy 9 as identified in Chapter 1.

Recreational use within the Decision Area typically starts during the early spring months at the lower elevations and progresses toward higher elevations as the snow melts and road conditions allow increased motorized access. The majority of use occurs during peak summer months when visitors are utilizing the developed and dispersed recreational sites, hiking the maintained trail system, picking huckleberries, and driving for pleasure on open roads. Mountain bicycling on several of the non-motorized hiking trails has increased during the last five years. In particular, mountain bicycling on Geneva Lake Trail and some of the longer restricted road systems has been increasing throughout the summer months. A secondary peak use occurs during the fall big game hunting season when forest visitors access portions of the area, generally within one mile of an open road. A minor, but increasing, amount of snowmobile and cross-country skiing use occurs during the winter periods, typically on the open roads that have not been plowed.

The dispersed recreational sites, located along the shore of Koocanusa Reservoir, generally within and south of Young Creek Bay, receive moderate-to-heavy use during the peak summer periods. Other recreational boating and fishing use on the reservoir within the proximity to the Decision Area is limited by access to the water. The majority of water-related use is in the Young Creek Bay area and at other selected sandy beaches, such as Sand Hill. Access to Robinson Mountain lookout cabin requires a 6.5 mile hike (via trails #22, 58 and 59). Use of the cabin is light, mainly by day users. Other dispersed recreational opportunities throughout the Decision Area include camping, big game hunting, hiking, berry picking, photography, and driving for pleasure. Berry picking, especially for huckleberries, occurs in the higher elevations, above 4000 feet.

In addition to the developed and dispersed recreational areas, the District also has two licensed day-use outfitter and guides who lead big game hunting trips into portions of the District, including the Decision Area. The Dodge and Young Creek drainages are known to have a number of deer and elk herds, which attract clients during the fall big game hunting season. Hunting within these and other smaller drainages within the Decision Area also occurs during the spring for black bear and in the late-winter months for mountain lion. Between November and March, some fur trapping by a number of local individuals occurs in the Decision Area.

The Robinson Mountain Inventoried Roadless Area is along the western boundary of the Decision Area. Please refer to the Inventoried Roadless Area section for more information.

Management of the recreation resource in the Decision Area utilizes the Recreation Opportunity Spectrum (ROS) (USDA Forest Service 1982). The ROS recognizes recreation opportunities, setting, and projected experiences along a spectrum or continuum. There are three classes applicable to the Decision Area, as shown in Recreation Table 3-1, below.

Recreation Table 3- 1 Recreation Opportunity Spectrum

	Semi Primitive Non-Motorized	Roaded - Natural	Roaded - Modified
Attributes	High probability of experiencing solitude closeness to nature. Access and travel is non-motorized on trails, some primitive roads, or cross-country.	Opportunity to affiliate with other in developed sites. Access and travel is conventional motorized.	Opportunity to get away from others, but with easy access. Little challenge and risk. Moderate evidence of other users on roads. Conventional motorized access.
Number of Acres (%) in Decision Area	2051 acres, (5%)	4167 acres, (11%)	31,822 acres, (84%)
Applicable Areas in the Decision Area	Includes portions of MA 2 and the mapped unroaded areas. Predominantly natural-appearing environment. Low interaction between users.	Small area on either side of Highway 37, where there is an opportunity to affiliate with other users in developed sites. Access is conventional including sedans, RVs and trailers.	The majority of the Decision Area includes both open and restricted road systems. Self-reliance is important in camping, and other outdoor activities. The natural-appearing environment is impacted by roads, landings, slash and debris.

ANALYSIS OF DIRECT AND INDIRECT EFFECTS

No significant issues were identified within the recreation resource during scoping. However, the need to evaluate recreation facilities and opportunities was brought up in public comments and was identified as part of the Purpose and Need for the project.

Occurrences of future natural events such as wildfires, insect infestations, or severe wind-throw could have adverse effects on recreational opportunities by changing the physical makeup, aesthetics of forested areas, and forest visitor sense of place.

Future wildfires could result in areas available for forest visitors to participate in activities such as huckleberry and mushroom picking, fire wood gathering, hiking on existing trails, and dispersed camping, as well as sightseeing and driving for pleasure,. While Alternatives 1, 1M, and 3 include timber harvesting and associated activities that may result in short-term effects, such as increased noise from the timber harvest activity and increased truck traffic on both the Dodge Creek Road, and Young Creek Road and secondary forest roads, the extended impacts and time horizons from those effects are generally less than would be expected from an intense wildfire.

Many of the long-term recreational access use patterns would be affected within Alternative 3 through the additional yearlong motorized restrictions of 1.19 miles on Road #303 and 0.17 miles on Road #7168.

These additional restrictions may affect those forest visitors who have or wish to travel on those roadways.

Road access management within the Decision Area may be modified slightly. Most of these are discussed in the Transportation section of this document. One change would improve motorized access to Koocanusa Reservoir near Young Creek over Road #7176A in Alternatives 1, 1M, and 3. This access would provide opportunities for smaller boats to launch within Young Creek Bay. Construction of the boat ramp, reconstruction of Road #7176A for 0.4 mile with parking for 20 to 25 vehicles, and placement of a restroom would respond to some public comments. Presently the closest boat-ramp is situated on the eastern side of Koocanusa Reservoir, Rexford Bench, approximately 21 miles to the east.

The proposed boat launch site and associated actions would respond to Purpose and Need statement E and relate to Strategy 8 as identified in Chapter 1.

Effects of Alternatives

Alternative 2 would retain the current recreational opportunities and use patterns throughout the Decision Area. It is expected that the existing conditions would slowly change over time; huckleberry patches would continue to be shaded over, and opportunities for berry picking would decrease. The ROS for the Decision Area would remain unchanged. Forest visitors' sense of place would remain unaltered. However as the forest continues to mature, suppression of large-scale wildfires may be more difficult. Should large fires occur, they would modify the recreational experiences now found within the two drainages, along the Marias Mountain ridge-top area, or within the Robinson Mountain IRA. Vegetative changes that may result from the fires would normally modify the forest visitor level of experience, and redirect their use patterns to non-burned settings. However as the forest continues to mature, suppression of all large-scale wildfires may not occur.

Implementation of this alternative would result in retaining the existing conditions in both motorized and non-motorized access in the Decision Area.

Effects Common to All Action Alternatives

Implementation of Alternatives 1, 1 M, and 3 would create a variety of additional vegetative open areas that forest visitors would encounter. Some of these areas would provide vistas, allowing increased viewing panoramas and create additional viewing opportunities for seeing wildlife or viewing the large-tree component. Alternative 1 would create much larger openings and patch sizes, moving toward more natural opening sizes within the mid-elevation areas of both Young and Dodge Creek drainages. Alternative 1M, although similar to Alternative 1 in that implementation of the alternative would modify various viewing panoramas and openings, would treat approximately 500 acres less than Alternative 1. Alternative 3 would result in placing additional small patch sizes on the landscape. The recreational experience to some forest visitors may change as the result of implementing vegetative changes on the landscape. These changes would appear unattractive to some forest visitors due to tree stumps, logging residue, or simply a more open forest setting. To some it may also affect their sense of place within a forest setting. The overall recreational experience for user groups would generally be based on an individual's perspective. The silvicultural prescriptions associated with Alternatives 1, 1M, and 3 for units above 4000 feet within VRU5N and VRU7N should increase huckleberry plant production in certain locations. Fuel reduction activity within Unit 46 occurring within Alternatives 1, 1M, and 3 would have a short-term recreational effect for those users on Trail 59 within the Robinson Mountain Inventoried Roadless Area, generally during the active burning and immediately following with associated increased smoke in the lower lying areas.

Analysis of Cumulative Effects

Cumulative effects are the result of all the impacts that past, current, and reasonably foreseeable activities have on a resource. A summary of activities are listed in the recreation section of the Project File. Tables 3-1 and 3-2 (pp III-2 - 4) contain the detailed analysis of all past, current, and reasonably foreseeable activities. Past activities have resulted in the "Existing Conditions" described above. The anticipated effects from proposed activities were then added to the existing conditions and described in the section titled "Direct and Indirect Effects." The sum of the existing conditions (including past actions) and the direct and indirect effects of proposed and combined with and reasonably foreseeable actions result in the cumulative effects descried in this section.

The Analysis Area for consideration of cumulative effects is the same area analyzed for the existing condition, direct, and indirect effects. This is appropriate because a forest visitor's recreation experience within this Analysis Area will be largely be determined from a combination of existing and proposed changes to the vegetation within the immediate area where they recreate.

Activities identified to have a measurable cumulative effect to the recreation resource are discussed below:

Vegetation Management

Current and reasonably foreseeable vegetative treatments were evaluated as to their effects on the recreation experience a forest visitor may have in relation to the ROS (Recreation Opportunity Spectrum). Because the majority of the area (84%) lies within Roaded – Modified, there would be no increased effect due to implementation of Alternatives 1, 1M, and 3. All proposed vegetative units are within Roaded – Modified.

Fuel Reduction Activities

Current and reasonably foreseeable prescribed burning would have a short term effect on the immediate area and recreational activities. In addition to the proposed activities

Livestock Grazing

Livestock grazing within the Analysis Area has not changed the recreational use patterns and the Recreational Opportunity Spectrum. There is no change anticipated under any alternatives discussed in this FSEIS.

Noxious Weed Control

Noxious weed control has a beneficial effect to recreational use of an area. Although the action alternatives have the potential to increase noxious weed spread through ground-disturbance activities, minimization of noxious weed spread is included in the design of criteria in all action alternatives.

Fire Suppression

Fire suppression and related activities will occur in the future. Wildfires that escape initial attack could modify the vegetative characteristics of a dispersed recreation site. Recreational use of those impacted sites would decrease. Due to the unpredictable nature of wild fires, effects to recreational use of one area over another are difficult to quantity. The action alternatives and reasonably foreseeable actions would lessen the risk of large-scale fire suppression operations occurring. Alternative 2 would not lessen this risk.

Road Management

The existing road system does and will continue to provide access to a variety of recreational sites. Under the action alternatives, road maintenance actions such as road blading, in addition to the proposed vegetative activities, could reduce access for a short term to certain areas during active road and logging activities. Decommissioning and intermittent stored service activities on existing closed roads would have negligible effects to recreational access. Implementation of Alternative 2 would not change the existing conditions.

Special Uses

Special use permits, including roads, water lines/ irrigation ditches, utilities, and the fish weir generally do not influence recreational patterns and use on National Forest lands. Outfitter and Guide permits that bring in additional recreational visitors to the forest are small in number and have not detracted other visitors and influenced the Recreation Opportunity Spectrum of the Analysis Area. No alternatives would change special uses in this area.

Activities on Private Land

Activities on private lands would have no effect on Recreational Opportunity Spectrum in any alternative.

State Land Activities

Activities on State of Montana lands would have no effect on Recreational Opportunity Spectrum because the lands are located in the lower portions of the Analysis Area where the recreational activity is minimal.

Overall there are no measurable cumulative effects identified to the recreation resource as result of implementation of Alternatives 1, 1M, 2, or 3.

Consistency with Regulatory Framework

Forest Plan

All alternatives are consistent with the Forest Plan standard that states, “All recreation activities and management will be based on the Recreation Opportunity Spectrum (ROS) inventory” (USDA Forest Service 1987a II-21).

Other Laws and Regulations

No other laws or regulations associated with Recreation were identified.

SCENIC RESOURCES

INTRODUCTION

Scenic resources are qualitative in nature, and include the physical, biological, and cultural attributes that give a particular place meaning and value to viewers.

EXISTING CONDITIONS AND TRENDS

Natural vegetation patterns and patch sizes in the Decision Area have historically resulted primarily from wildfires. Patch sizes ranged from as small as 50 acres up to 5000 acres, depending on the Vegetative Response Unit (VRU). Most patches were in the 1000 to 2000 acre range. Refer to the Vegetation and Disturbances section, pages III-28 through III-30, for a description of VRUs. However, as a result of timber harvest that occurred over the past 30 to 50 years, the landscape of the Decision Area has been altered with openings that do not appear natural. Since 1980, 221 units in the Decision Area ranging from 0.7 to 197 acres have been harvested using a regeneration prescription. Of these 221 units, 210 are less than 50 acres. The average size of all the regeneration units in the Decision Area is 22 acres. These geometrically-shaped units result in a high degree of form, line, and color contrast between the harvested and non-harvested areas. This contrast is particularly evident during the winter months when snow is present. Generally, these units are scattered from the mid-to-upper slopes.

While timber harvest has occurred on 47 % of the Decision Area, approximately seven percent of this area falls within Scenic Integrity Levels of “Low”, 72% as “Very Low” and nine percent as “Moderate” (see Scenic Resources Table 3-1, below). Refer to the Scenic Resources section of the Project File for a map of the Scenic Integrity Levels in the Decision Area.

FOREST PLAN DIRECTION

The Forest Plan utilized Visual Quality Objectives (VQOs) to assess how proposed activities might change the visual character of the landscape (USDA Forest Service 1974; USDA Forest Service 1987a II-27). However, subsequent to the Forest Plan, the Scenic Management System (SMS) was developed to assess landscape quality and how proposed activities modify the visual quality of a landscape. The SMS uses Scenic Integrity Levels (SILs) to determine compliance with visual quality standards (refer to the letter dated August 22, 1994 in the Scenic Resources section of the Project File). The SMS meets Forest Plan direction.

As defined by the SMS, existing vegetation patterns on the landscape, including those resulting from management activities, are assessed based on how much variation from naturally-created (historical) patterns due to wildfire or insect infestation has occurred. This assessment considers shapes, edges, color contrasts, and texture differences created by management activities. Usually, geometric shapes, straight lines, abrupt edges, and sharp contrasts in color and texture create unnaturally-appearing landscapes (USDA Forest Service 1995d 30-34; F3; I-14-17; 2-4 to 2-7; and 4-12 to 4-15).

Scenic Resources Table 3-1 displays the relationship between VQOs and SILs in the Decision Area.

Scenic Resources Table 3- 1 Visual Quality Objectives and Scenic Integrity Levels

Visual Quality Objectives	Scenic Integrity Levels	Acres (%) in the Decision Area
Retention – Human activities are not evident to the casual Forest visitor	High - Refers to landscapes where the valued landscape character appears "intact." Deviations may be present, but must repeat form, line, color, texture, and pattern common to the character so completely that they are not evident.	3700 (10)
Partial Retention – Human activities may be evident, but must remain subordinate to the characteristic landscape	Moderate - Refers to landscapes where the valued landscape character appears "slightly altered." Noticeable deviations must remain visually subordinate to the landscape character being viewed.	2960 (9)
Modification – Human activity may dominate the characteristic landscape, but must, at the same time, utilize naturally established form, line, color, or texture. It should appear as a natural occurrence when viewed in the middle ground or background.	Low - Refers to landscapes where the valued landscape character appears "moderately altered." Deviations begin to dominate the valued landscape character being viewed but they borrow valued attributes such as size, shape, edge effects, and pattern of natural openings. They should be compatible or complementary to the landscape character.	2652 (7)
Maximum Modification – Human activity may dominate the characteristic landscape, but should appear as a natural occurrence when viewed as background.	Very Low – Refers to landscapes where the valued landscape appears "heavily altered." Deviations may strongly dominate the landscape character. They may not be appropriate in shape, edge effect, or patterns. However, deviations must be shaped and blended with landforms so that elements such as unnatural edges or landings do not dominate the composition.	27,272 (72)

Scenic Integrity is defined in this context as "limited to the deviations from or alterations of the existing landscape character that is valued for its aesthetic appeal" (USDA Forest Service 1995d F-3). The Scenic Integrity of the Decision Area was determined based on the following viewpoints, which provide a variety of views into the Decision Area: the Dodge Creek Road #470 one mile southwest of the #303 Road junction and ½ mile west of junction with Road #7168; Young Creek Road #7202, a point 2 miles east of the intersection with Road #7205; Rexford Bench Boat Ramp; Robinson Mountain lookout cabin; and a point along the West Kootenai County Road #92 near Koocanusa Reservoir. Refer to the Scenic Integrity Map and photographs within the Scenic Resource Project File.

From many of these view points, the overall scenic characteristic of the Decision Area is within the SILs of "Low" to "Moderate". However, several view areas that visually dominate the forest user are outside of the targeted SILs. These areas of past harvest are in the foreground (¼ to ½ mile from the observers) of the view. It must be mentioned that these same areas when viewed from the "Middle ground" (3-5 miles from the observer) or as "Background" (greater than 5 miles from the reference point) tend to blend in with the surrounding landscape and go largely un-noticed to the typical forest visitor.

ALTERNATIVE 2

This alternative would maintain the existing conditions. There would be no vegetative management, including timber harvest, thinning, or prescribed burning. This action would retain a large portion of the unnatural appearing geometric patterns and small patch sizes on the landscape over the next 50 plus years. The differences in vegetative patterns would occur until forest growth adds diversity in color and texture, blending the existing patterns into the landscape.

In addition, should stand-replacing fires occur within the Decision Area within the next 50 years, there would be a greater potential to vastly modify the landscape over a larger scale. While the fires would create more natural appearing patch sizes by combining the existing geometric vegetative patterns and blending the shapes with non-affected areas, the overall appearance for many forest users would be unacceptable.

EFFECTS COMMON TO ACTION ALTERNATIVES 1, 1M, AND 3

Alternatives 1, 1M, and 3 propose various combinations of vegetative treatments (timber harvest, thinning and prescribed burning) that would result in beneficial changes to the scenic character of the Decision Area. These changes would include a noticeable increase in overall patch sizes, a decrease in areas treated with abundant geometric patterns, and a blending with unmanaged stands. The mapped shapes of the units are for representation purposes only, and show the treatment areas relative to other features on the landscape. The exact boundaries of the units would be determined during sale layout. They would conform, to the extent possible, to the more naturally appearing stand patterns on the landscape. Depending on silvicultural prescription and existing stand composition, layout and marking techniques could include retaining a greater number of larger fire-resistant and wind-tolerant trees scattered at different densities within the harvested areas. Retaining groups of trees and blending into or away from previously harvested or non-harvested areas would move the existing SILs of "Very Low" or "Low" toward a SIL of "Low" to "Moderate".

The proposed harvest treatments vary in their effects on scenic quality. Given the amount of vegetative change that would occur, regeneration harvest techniques could have the greatest impact on scenic integrity. Approximately 80-95% of the canopy would be removed with this silviculture method (seed tree with reserves and clearcut with reserves). In comparison, intermediate harvest (commercial thinning) technique would remove approximately 50% of the canopy.

The long-term effects of vegetative treatments on the scenic resource would be minimized through the use of naturally-appearing unit shapes, and the retention of sufficient numbers of trees to help blend the openings with the surrounding landscape.

Improved Scenic Integrity Levels through timber harvesting methods would be used to decrease geometric patterns in existing openings, blending the small unnaturally-appearing ones into larger patches that emulate natural landscape patterns.

Timing and fuel conditions during fuel treatment could have varied effects on meeting the scenic quality objectives. Fuel treatment would occur following all timber harvest in Alternatives 1, 1M, and 3. Specific fuel treatments would be determined following harvest activities to minimize the effects to the residual stand. One effect from fuel treatment to the scenic resource is the color contrast between the treated and adjacent stands. Underburning would have the most noticeable effect to the scenic resource, as compared to other fuel treatments. This treatment would create the largest contrast of scorched boles, red needles, and burnt litter, which would be noticeable through the first two to three growing seasons. Depending on burning conditions, the amount of heat generated, and the amount of canopy retention within the treated units, underburning may also cause a color change in the overstory canopy from green to red and then later to shades of gray. It is expected that these effects would occur in a mosaic pattern across areas treated within the Decision Area.

Effects to foreground views may include burned stumps, changes in soil color, and a reduction of understory vegetation. Over the long-term, those changes would soften due to vegetative regrowth. The effects as seen from middle ground and background views would be less visible, due to the distance from the viewer and amount of detail that can be distinguished from any one view point.

Units 46, 48, 125, and 216 (prescribed burn only-ecosystem), as well as Units 4, 7, 8, and 9 (prescribed burn only-maintenance), would have varying degrees of visual effects following treatment along portions of some open roads (Young Creek, Dodge Creek, and from Koocanusa Reservoir). Red needles would be present for a short duration of up to three years. The majority of red needles would not be readily noticeable beyond the foreground. Bole scorch would be noticeable the longest, lasting 3-5 years or more in the foreground view. Additional prescribed burning in harvest treatment units would result in similar short-term changes to the landscape. Overall any type of fuel reduction activity is not expected to result in a long-term modification to the SILs.

Another consequence of prescribed burning on the scenic resource would be intensity and duration of smoke. It is typical to observe smoke concentrations in the valley bottoms during the evening and morning period during burning and for up to three days following the burn. Diurnal heating and mixing of the air masses would disperse smoke as the inversions break in the early morning and mixing continues throughout the afternoon hours. Residual smoke production from large logs, stumps, and piles can be expected for several days. This smoke may at times be sufficient to obscure background peaks from selected viewpoints.

Various types of Special Uses existing in the eastern portion of the Decision Area are generally associated with private property. In addition, there are two proposed utility corridors for buried electrical and telephone lines, as well as anticipated road access permits for private land (see MAP 3-12). These proposals would provide necessary service and improved access to private lands in the future should they undergo development.

DIRECT AND INDIRECT EFFECTS OF ACTION ALTERNATIVES

Alternative 1

Alternative 1 proposes to treat approximately 6932 acres with a variety of timber harvesting methods and prescribed burning with mechanical pre-treatment, creating the greatest number of larger patch sizes. This action would have the greatest improvement on the scenic resource within the shortest time period. It proposes to increase more natural patch sizes patterns, while combining the largest number of geometrically-shaped units. This reduces the appearance of unnaturally-appearing lines and shapes. It would have a blending effect on the form and line of past harvest activities, resulting in improved overall scenic integrity. However, the overall SILs would only be slightly improved due to the limited amount of total area being affected during this entry. To greatly improve the SIL, 4 to 5 times the amount of past harvested areas need to be blended by creating larger, more natural patch sizes on the landscape. Proposed treatment units, such as Units 17, 21, 25, and 40 would improve the overall landscape character, in time, appearing to be moderately altered versus heavily altered, thus moving toward a SIL of “Low”. This softening of form and line occurs on a limited basis, and would not result in an immediate change in the scenic resource.

Alternative 1M

Alternative 1M proposes to treat approximately 6478 acres with a variety of timber harvesting methods and prescribed burning with mechanical pre-treatment, creating a number of increased patch sizes. This action would have the second greatest improvement on the scenic resource within the shortest time period. It proposes to increase more natural patch sizes patterns, while combining the largest number of geometrically-shaped units. This reduces the appearance of unnaturally-appearing lines and shapes. It would have a blending effect on the form and line of past harvest activities, resulting in improved overall scenic integrity. However, the overall SILs would only be slightly improved due to the limited amount of total area being affected during this entry. To greatly improve the SIL, 4 to 5 times the amount of past harvested areas need to be blended by creating larger, more natural patch sizes on the landscape. Proposed treatment units, such as Units 17, 21, 25, and 40 would improve the overall landscape character, in time, appearing to be moderately altered versus heavily altered, thus moving toward a SIL of "Low". This softening of form and line occurs on a limited basis, and would not result in an immediate change in the scenic resource.

Alternative 3

Alternative 3 would treat approximately 2812 acres in smaller block patterns. The proposed harvest units would increase the overall patch size and reduce existing geometrically-shaped areas within the Decision Area. While these treatment areas are combining a number of existing patches, thereby reducing the unnatural-appearing openings scattered across the landscape, the overall patch sizes are below what is proposed within Alternative 1 and 1M, resulting in a smaller benefit. The SIL for the area under this alternative would move toward "Low" from "Very Low", but to a lesser degree than Alternatives 1and 1M.

ANALYSIS OF CUMULATIVE EFFECTS

Cumulative effects are the result of all the impacts that past, current, and reasonably foreseeable activities have on a resource. A summary of activities are listed in the recreation section of the Project File, contains the detailed analysis of all past, current, and reasonably foreseeable activities listed in Tables 3-1 and 3-2 (pp III-2 - 4). The results of past activities have resulted in the "Existing Conditions" described above. The anticipated effects from proposed activities were then added to the existing conditions and described in the section titled "Direct and Indirect Effects." The sum of the existing conditions (including past actions) and the direct and indirect effects of proposed and combined with reasonably foreseeable actions result in the cumulative effects described in this section.

The Analysis Area for consideration of cumulative effects is the same area analyzed for the existing condition, direct, and indirect effects. This is appropriate because a forest visitor's recreation experience within this analysis area will be largely be determined through a combination of existing and proposed changes to the vegetation within the immediate area where they recreate.

Activities identified to have a measurable cumulative effect to the recreation resource are discussed below:

Vegetation Management

The majority of the area (72%) lies where the landscape appears to be "Heavily Altered" at a level of "Very Low," any vegetative treatment that reduces line and form would move the overall integrity level toward the desired level of Low. The proposed vegetative treatment would result in an improvement. Alternative 1 would create the greatest change within the shortest time frame. Alternative 1M would have the second largest change toward improving the SILs.

Commercial thinning and underburning, as well as planting projects are not expected to have cumulative effects on the long-term scenic resource. Their location and overall limited size, when viewed from selected viewpoints, such as Koocanusa Reservoir and the open roads within the Decision Area, would largely not modify the existing SILs. However, within selected areas the existing un-natural patterns would be softened and the landscape appearance improved.

Fuel Reduction Activities

Prescribed burning following vegetative treatment would have a short term effect on the immediate area and SILs. The proposed fuel reduction activity within Unit #46 would result in a short term effect to SILs and those using Trail #59 within the Robinson Mountain Inventoried Roadless Area.

Livestock Grazing

Livestock grazing within the Analysis Area has not changed nor would implementation of any action alternative result in changing the Scenic Integrity Levels.

Noxious Weed Control

Noxious weed control has a beneficial effect to maintaining and improving the Scenic Integrity Levels. Although the action alternatives have the potential to increase noxious weed spread through ground-disturbance activities, project design criteria would minimize the spread of noxious weeds.

Fire Suppression

Fire suppression and related activities will occur in the future. Wildfires that escape initial attack could modify the vegetative characteristics resulting in the greatest alternation of Scenic Integrity Levels. Although a wildfire would reduce the existing form and line now on the landscape, the overall SILs would appear to the typical forest visitor as being “Moderately Altered”. Due to the unpredictable nature of wildfires, effects to scenic resources are difficult to quantify. The action alternatives and reasonably foreseeable actions would lessen the risk of large-scale fire suppression operations occurring, thereby maintaining the current SLIs. Alternative 2 would not lessen this risk.

Road Management

The existing road system does and will continue to provide access to the Young Dodge drainages. The open roads provide opportunities for vegetative treatment. Implementation of any action alternatives, including road maintenance such as road blading, in addition to the proposed vegetative activities would not have any overall further reduction in the SILs. Decommissioning and intermittent stored service activities on existing closed roads would have negligible effects to improving the SILs. Implementation of Alternative 2 would not change the existing conditions.

Special Uses

Special use permits, including roads, water lines/ irrigation ditches, utilities, and the fish weir, are small in nature and generally do not influence SILs and use on National Forest lands. Outfitter and Guide permits encourage additional visitors to the Forest; however, they are relatively small in number and result in no change in the SILs.

Activities on Private Land

Activities on private lands would have no effect on Scenic Integrity Levels because the areas are small and in lower elevations.

State Land Activities

Activities on State of Montana lands would have no effect on Scenic Integrity Levels because the lands are located in the lower portions of the Analysis Area where the changes are relatively small and blend in with the surrounding landscape.

Overall there are minimal measurable cumulative effects identified to the scenic resource as result of implementation of Alternatives 1, 1M, 2, or 3. Implementation of Alternative 1 would result in the greatest improvement to the Scenic Integrity Level followed by Alternatives 1M and then 3. Alternative 2 would not improve the SIL.

Alternatives 1, 1M, 2, and 3 – There could be cumulative effects to the scenic resource from wildfire suppression activities because of unnatural appearing fire lines and associated soil disturbance with ground-based suppression equipment. There would be a beneficial effect as the result of implementation of Alternative 1 in vegetative management resulting in moving toward the Forest Plan SIL in a more-timely manner than the other alternatives. Alternative 1M would also have a beneficial effect by moving toward the desired SIL through the combining of smaller unnatural appearing openings into larger units with less geometric shapes. However, the total effect of Alternative 1M would be less than could be achieved in a shorter time frame in Alternative 1.

Alternative 2 would maintain the current conditions resulting in no cumulative effects to the scenic resources. Alternative 3 would have a slight beneficial cumulative effect to the scenic resources.

CONSISTENCY WITH REGULATORY FRAMEWORK

Forest Plan

Vegetative treatment proposed in Alternative 1 and 1M would move toward the Forest Plan objective where the landscape appears “Moderately Altered” (SIL of “Low”) rather than maintain the current landscape that appears “Heavily Altered” (SILs of “Very Low”). Alternative 1 and 1M would move toward Forest Plan Objectives. The limited harvest proposed in Alternative 3 would retain blockier geometric patterns on the landscape. While it would not further degrade the overall SIL, it does not move toward the Forest Plan SIL objective of “Low”, within a reasonable timeframe. Alternative 2 would retain the large areas of unnatural-appearing patch sizes in the “Low” to “Very Low” SIL.

While all alternatives are within the broad framework of being consistent with Forest Plan direction, the time frame of how fast the area recovers and moves toward the desired SIL is the difference within the three action alternatives.

Other Laws and Regulations - There are no other laws and regulations applicable to the scenic resource.

INVENTORIED ROADLESS AREA

INTRODUCTION

The purpose of the analysis on the roadless resource is to disclose potential effects to roadless and wilderness attributes and determine if, or to what extent it might affect future consideration for wilderness recommendations. This analysis focuses on the potential effects of project activities on wilderness characteristics as defined in the Forest Service Handbook (FSH) 1909.12(72.1). Wilderness characteristics, as defined at FSH 1909.12 (72.1) and evaluated here include the following:

1. Natural – The extent to which long-term ecological processes are intact and operating.
2. Undeveloped – The degree to which the impacts documented in natural integrity are apparent to most visitors.
3. Outstanding opportunities for solitude or primitive unconfined recreation – Solitude is a personal subjective value defined as the isolation from sights, sounds, and presence of others and from developments and evidence of humans. Primitive recreation is characterized by meeting nature on its own terms, without comfort and convenience of facilities.
4. Special features and values – unique ecological, geographical, scenic and historical features of an area.
5. Manageability – The ability to manage an area for wilderness consideration and maintain wilderness attributes.

The analysis for the effects on other roadless resource attributes such as water resources, soils, and wildlife habitat may be found in other sections of the NEPA document.

EXISTING CONDITION AND TRENDS

The Decision Area of 37,900 acres has largely been modified over the past 70 years by past forest management and other activities. These activities include the development of roads, harvesting of timber and the impoundment of the Kootenai River by the Libby Dam project. Robinson Mountain Inventoried Roadless Area (IRA) #164 bounds the western side of the Decision Area.

The IRA totals 7038 acres, of which 2051 acres are within the Decision Area. The remaining portion of the Roadless Area lies to the west on the Three Rivers Ranger District. No public drinking water source has been identified within the Decision Area portion of the IRA. Refer to the Inventoried Roadless Area section of the Project File for a map showing these areas. MAP 3-13 at the end of this chapter displays Inventoried Roadless Areas within the Decision Area.

Nine Roadless Area Characteristics were used to evaluate the area as to its ability to possess roadless area characteristics. These nine criteria were also compared with five established Wilderness Attributes. IRA Table 3-1 describes the link between the wilderness features and the roadless characteristics.

IRA Table 3- 1 Wilderness Attributes and Roadless Characteristics

Wilderness Attributes	Roadless Area Characteristics
Natural - the extent to which long-term ecological processes are intact and operating	High quality or undisturbed soil, water, and air Sources of public drinking water Diversity of plant and animal communities Habitat for threatened, endangered, candidate, proposed, and sensitive species dependent on large areas
Undeveloped – the degree to which an area is without permanent improvements or human habitation.	Natural appearing landscapes with high scenic quality
Solitude and Primitive Recreation – Opportunities to experience isolation from sights, sounds, and presence of others. Opportunities to experience isolation from others, to feel a part of nature, to have a vastness of scale and a degree of challenge and risk while using outdoor skills.	Primitive, semi-primitive non-motorized, semi-primitive motorized ROS classes of dispersed recreation.
Special features - Unique and/or special geological, biological, ecological, cultural, or scenic features.	Other locally identified unique characteristics. Traditional cultural properties and sacred sites.
Manageability/boundaries - Ability to manage a roadless area to meet the minimum size criteria (5,000 acres) for wilderness.	No criteria.

ANALYSIS OF DIRECT AND INDIRECT EFFECTS

Effects of proposed actions were determined using a qualitative discussion based on amount and type of proposed activities within or adjacent to the mapped roadless area.

Alternative 2 (No Action Alternative) does not include proposed management activities in the IRA. There would be no direct effects to characteristics found within the IRA.

Management direction and natural events would continue to affect vegetation within this IRA. Unplanned ignitions or wildfires may occur in or burn into all or parts of the IRA. Generally, wildfires occur during drier and hotter conditions resulting in changes to some resources. These types of fires would affect, to a high degree, the overall diversity of habitat for plant and animal communities, changing available habitat for threatened, endangered, candidate, proposed, and sensitive species dependent on large areas, and causing detrimental impacts to cultural properties and sacred sites.

EFFECTS COMMON TO ALL ACTION ALTERNATIVES

The ecosystem burn, Unit 46, from Alternatives 1, 1M, and 3 is proposed for selected acres within the IRA. Although no long-term effects are anticipated, a number of short-term effects may occur to various IRA characteristics. A short-term effect within Unit 46 would be to the “high quality of undisturbed air” attributable to periods of fuel reduction and prescribed burning. These fuel reduction activities would kill a number of smaller trees, cause additional needles on larger trees to turn red, and cause the ground areas to turn black for one to two seasons. Effects outside of Unit 46 would include smoky conditions that could last for one to several weeks. Wind direction at the time of the burn could result in varying effects to forest visitors and down valley residents (see Air Quality section).

EFFECTS OF ALTERNATIVES

Alternative 2 would retain the current roadless characteristics and use patterns. Existing conditions would generally remain unless altered by natural events such as a wildfire or bug infestation.

Implementation of Alternatives 1, 1M, or 3 would create a variety of additional vegetative open areas and burned areas. All action alternatives would create natural appearing openings within Unit 46 as a result of the prescribed fire. The prescribed burning activity would modify the current vegetative characteristics and move them toward a more natural appearing landscape of a more open landscape with rock exposures. In Alternatives 1, 1M, and 3, the overall IRA characteristics would be retained because the vegetative patterns would appear natural and the effects from burning would be only short-term. In three to five years, the general forest visitor would largely not notice the management activities.

Effects of Alternatives on Wilderness Attributes

Natural Integrity

The Robinson Mountain Inventoried Roadless Area (IRA) currently displays a high degree of Natural Integrity. The area has had occurrences of natural fires; however due to 90 years of fire suppression, some areas, such as Vegetative Response Units 9 and 10 have fuel loads that are high. Fire suppression also influenced the type, size, and diversity of vegetation found. The risk of a severe fire event is higher in areas where fuel buildups have occurred or are retained as in Alternative 2. Should a wildfire event occur, there would be an increased potential for surface erosion, stream channel effects, and short-term reductions in air quality within the roadless area due to the fire consuming vegetation over large area. Large fires would also modify the current vegetation mosaic and diversity in plant and animal communities. In Alternatives 1, 1M, and 3, the natural integrity would improve as fire is reintroduced to the landscape. The prescribed burn would improve the vegetation mosaic and diversity of the roadless area.

Apparent Naturalness

The area displays a sense of naturalness, rock outcroppings and benches dominate much of the landscape. The environment appears natural to the average forest visitor. Implementation of Alternative 2 would have no direct effect on maintaining the Apparent Naturalness in the Decision Area. A potential indirect effect could be that a natural wildland fire escaping initial attack efforts could become a large-scale wildfire. This would result in greater impacts to the Apparent Naturalness of the area when compared to conducting a planned ignition under more favorable conditions. In Alternatives 1, 1M, and 3 the prescribed fire proposed within Unit 46 would result in reduced fuel loads. The treatment would likely have the appearance of a wildfire that began under conditions resembling an average burn day (refer to Fuels section for a description).

Remoteness and Solitude

Remoteness and Solitude are addressed within the Recreation Opportunity Spectrum semi-primitive non-motorized (USDA Forest Service 1982), as being places where a forest visitor could expect a high probability of experiencing closeness to nature, tranquility, and self-reliance. Vegetative alterations are small in size, widely dispersed, and not easily evident. The area has a high degree of remoteness.

The areas adjacent to the IRA affect the overall remoteness and solitude due to the travel of noise and sense of "being away" from it all. Those adjacent ROS classifications include roaded natural and roaded modified areas.

IRA Table 3- 2 Recreation Opportunity Spectrum Acres by Roadless Area and Surrounding Areas

Roadless Area	Semi-primitive non-motorized	Semi-primitive motorized	Roaded Natural	Roaded Modified
Robinson Mountain	2051 Acres	5400 acres	0	0

There would be no effect within or directly adjacent to the IRA from implementing Alternative 2. There would be short-term effects on forest visitor sense of Solitude and Remoteness during active harvesting in the lower drainage areas, and during prescribed burning activities in Alternatives 1, 1M, and 3. This reduction in Solitude and Remoteness would be from equipment noise during harvest activities, aerial ignition of fuels and subsequent burning for one to three days.

Special Features and Special Places

All alternatives would have no overall effect on Special Features in the Decision Area. All special features within the Decision Area are the result of geomorphology and would not be affected through management activities. While all cultural sites would be protected under all alternatives there may be some short-term effect to forest visitors at these sites or at other identified special features/places during time of burning when smoke is in the air.

Manageability and Boundaries

Boundaries of IRA #164 utilized a variety of drainages patterns and ridgelines, as well as inventoried roads, and natural stream channels. Alternatives 1, 1M, and 3 would not change or impact any parameter of the Manageability or identification of Boundaries, because the activity is well within the IRA.

ANALYSIS OF CUMULATIVE EFFECTS

Cumulative effects are the result of all the impacts that past, current, and reasonably foreseeable activities have on a resource. The Cumulative Effects Worksheet, located in the IRA section of the Project File, contains the detailed analysis of all past, current, and reasonably foreseeable activities listed in Tables 3-1 and 3-2 (pp III-2 through III-4). While no activities have been identified that may result or have resulted in a measurable cumulative effect to the IRA, the following discussion documents the anticipated effects resulting from neighboring proposed activities including past actions and reasonably foreseeable actions as to their association on the IRA.

Vegetation Management

There has been no past timber harvest within the IRA. The existing vegetative conditions and patterns are the result of natural events such as wildfires or wind events. No alternatives propose timber harvest within the IRA and would have no effect on the IRA.

The associated small sales within the commercial thinning, underburning, and planting projects are not expected to have cumulative effects on the long-term management of the IRA because they are not located within the IRA.

Fuel Reduction Activities

Prescribed burning in the IRA would have a short-term effect during active fuel reduction from smoke and reduction in air quality. In addition, the fuel reduction activity outside the IRA would also have a short-term effect to those forest visitors using Trail #59 within the IRA. This activity may limit the use of trail #59 which accesses the roadless area during the periods when the activity is occurring. Alternative 2 would have no effect on the IRA.

Livestock Grazing

Livestock grazing does not occur within the IRA, therefore there would be no cumulative effect as the result of implementation of any action alternative.

Noxious Weed Control

Noxious weed control has a beneficial effect to maintaining the intent and management of the IRA. Although the action alternatives have the potential to increase noxious weed spread from surrounding active managed areas design, the criteria for minimizing spread of noxious weeds is in all th**e** action alternatives will minimize the potential impact to the IRA.

Fire Suppression

Fire suppression and related activities will occur in the future. Wildfires that escape initial attack could modify the vegetative characteristics resulting in the greatest alteration of to the IRA. Although wildfires are part of the overall ecosystem, the unpredictable nature of these fires makes effects to the IRA difficult to quantity. The action alternatives and reasonable foreseeable actions outside of the IRA would lessen the overall risk of large-scale fires and their affects to IRA. Alternative 2 would not lessen this risk.

Road Management

There are no roads within the IRA. The open roads outside of the IRA provide increased motorized access for vegetative treatment opportunities and allow easier access to the IRA for forest visitors. Implementation of any action alternatives, including road maintenance such as road blading, would not have any overall cumulative effect to the IRA. Implementation of Alternative 2 would not change the existing conditions.

Special Uses

There are no Special use permits within the IRA. There are two Outfitter and Guide permits within the Young Dodge drainages for big game hunting. The level of use is relatively small resulting in no cumulative effects to the IRA.

Activities on Private Land

Activities on private lands would have no effect to the IRA because the private land is separated from the IRA and at lower elevations.

Other Agency

Activities on State of Montana lands would have no effect on the IRA because the lands are located in the lower portions of the Analysis Area.

The overall measurable cumulative effects identified within or near the IRA as result of implementation of Alternatives 1, 1 M, 2 or 3 would have no effect to the IRA.

Summary

Alternatives 1, 1M, 2, or 3 would improve the natural integrity of the roadless area although there would be some sort term affect to solitude and primitive recreation opportunities while the activities are occurring. These alternatives would not affect the ability for the area to be considered for potential wilderness designation under the Wilderness Act of 1964.

CONSISTENCY WITH REGULATORY FRAMEWORK

Forest Plan

The lands within the IRA where the prescribed burn would occur are in Management Area 2. The prescribed burning is consistent with this management direction because Wildlife and Fish Standard 1 states that "Wildlife habitat will generally be managed in a natural condition, but habitat enhancement may occur using prescribed fire." Also, Fire Standard 1 states that "Planned Ignitions are acceptable as a means of fuels management and wildlife habitat enhancement." Only prescribed burning would occur under Alternatives 1, 1M, or 3. No slashing or fireline construction would be necessary to implement the action.

TRANSPORTATION

INTRODUCTION

Forest roads are an essential part of the transportation system designed to support multiple use of National Forest System lands. They help to meet recreational demands and facilitate access to forest commodities. Forest roads provide access needed to manage the many resources of each forest ecosystem.

Along with the benefits of forest roads, come the ecological risks and impacts to the landscape. Roads contribute to water quality degradation, reduced wildlife habitat and security, and the loss of soil productivity through compaction, erosion and the dispersal of noxious and exotic plant species. Roads are a long-term commitment of the land. While the effects cannot be eliminated as long as the road exists on the landscape, many of the ecological effects can be minimized.

The goal of the interdisciplinary transportation analyses is to identify a road system that:

- Meets management objectives
- Is safe and responsive to public needs and desires
- Is affordable and efficiently managed
- Has minimal negative ecological effects on the land
- Is in balance with available funding for needed management actions

The Young Dodge Roads Analysis and Travel Analysis were completed in February 2007. The Roads Analysis is a separate, independent document, resulting from an interdisciplinary analysis of the existing road system. The Roads Analysis produces a list of opportunities that could reduce the environmental risk of roads and bring the road system closer to the management goals described below. The Travel Analysis examines the current road management and results in recommended road management changes that would provide a full range of motorized and non-motorized opportunities balanced with any legal and environmental constraints.

These two analyses were combined into one document entitled the Young Dodge Roads Analysis and Travel Analysis Report, which provides a detailed road-by-road analysis of the existing condition. Therefore, this section will only summarize information that can be found in greater detail in the Young Dodge Roads Analysis and Travel Analysis Report.

REGULATORY FRAMEWORK

The Roads Analysis complies with 36 CFR Part 212 Administration of the Forest Transportation System Final Rule and with the Forest Service Transportation Administrative Policy FSM Chapter 7700 (2001). The final rule is intended to help ensure that additions to the National Forest System road network are those deemed essential for resource management and use; that construction, reconstruction, and maintenance of roads minimize adverse environmental impacts; and that unneeded roads are decommissioned and restoration of ecological processes are initiated.

The new policy removes emphasis on transportation development and adds a requirement for science-based transportation analysis. This science-based analysis process is located in the USDA Forest Service Miscellaneous Report FS-643, Roads Analysis: Informing Decisions about Managing the National Forest Transportation System (1999).

On November 9, 2005, the new final rule for 36 CFR Parts 212, 251, 261 and 295 was issued to address travel management and designated routes for motor vehicle use. This rule establishes the development of a Motor Vehicle Use Map for each Administrative Unit. The Young Dodge ID Team completed a Travel Analysis under the requirements of this new final rule.

FOREST PLAN DIRECTION

The Kootenai National Forest published its Forest Plan in September 1987 to comply with the National Forest Management Act of 1976 (NFMA); the regulations for National Forest Land and Resource Management Planning (36 CFR Part 219); and the National Environmental Policy Act of 1969 (NEPA). This Forest Plan guides all natural resource management activities and establishes management standards for the Forest. It describes resource management practices, levels of resource production and management, and the availability and suitability of lands for resource management. It also gives goals, objectives, and standards for resource management for the entire Forest in general and for specific subdivisions of the Forest called Management Areas (MAs). Goals, objectives, and standards that apply to Forest System Roads (roads wholly or partly within or adjacent to and serving the National Forest System and which are necessary for the protection, administration and utilization of the National Forest System and the use and development of its resources) are stated below. A glossary to assist in the understanding of certain terms used to describe or categorize roads is also included in the Transportation section of the Project File.

Goals

Goals of Forest Plan Management direction are normally expressed in broad general terms that describe a desired condition to be achieved sometime in the future. General Forest-wide goals that apply to roads include the following and may be found on page II-1 of the Forest Plan:

1) Construct the minimum number of roads necessary to permit the efficient removal of timber and mineral resources. Construct and reconstruct roads only to the minimum standards necessary to prevent soil loss, maintain water quality, minimize safety hazards for a reasonable and prudent Forest user, and provide access for fire protection where needed to meet MA goals.

2) Maintain a balance of open and closed roads to continue present levels of motorized access, insure big-game habitat security, insure grizzly bear security to meet recovery goals, and reduce road maintenance costs.

Objectives

Forest Plan management objectives are concise statements of measurable results that respond to pre-established goals and are classified in the Forest Plan by various resources. General Forest-wide objectives relating to roads include the following and may be found on pages II-4, 5, 7 and 10 of the Forest Plan:

1) Roads, including capital investment roads (those built with specially appropriated funds) will be built to access harvest areas on schedule (Timber).

2) The Forest Travel Planning process will be used to review, evaluate and implement the goals and standards of the MAs, with regard to roads, trails and motorized vehicle use (Recreation).

3) Ground disturbing activities such as road construction, road reconstruction, and timber harvest will be accompanied by mitigating measures to prevent or reduce increases in sedimentation and stream channel erosion. Soil and water conservation practices and/or those activities that prevent or reduce stream sedimentation will be implemented. Examples include: location of roadbeds out of stream bottoms, design of stream crossing structures to

allow water to freely pass, rock surfacing of roads at stream crossings, keeping equipment from operating in or alongside streams and maintenance of roads to allow proper drainage (Soil and Water).

4) Each project plan for which the use of heavy equipment is required shall evaluate the effect of operating that equipment on soil productivity. When it is determined that equipment operation is a hazard to soil productivity the project plan shall establish a standard for how much of the project area will be allocated to skid trails, landings, temporary roads or similar areas of concentrated equipment travel. The standard shall minimize the area allocated to those uses to the extent practical (Soil and Water).

5) Transportation facilities including roads, trails and bridges will be constructed and maintained to meet the objectives of the Forest Plan (Roads and Trails).

Standards

The Forest Plan also contains standards that supplement National and Regional policies, standards and guidelines found in Forest Service Manuals, Handbooks and the Northern Regional Guide. These are also classified by the various resource or function. Those pertaining to roads include the following and can be found in the Forest Plan on pages II-21, 25 and 30:

1) The most cost effective logging system (including associated roads) that meets the MA standards will be used (Timber).

2) Developmental activities will be rigorously examined to insure that the minimum number and length of roads are constructed to the minimum standard necessary (Roads).

3) The Forest Travel Planning Process will be used to review, evaluate, and implement the goals and standards of the MAs in the Forest Plan with regard to road, trail and area wide motorized vehicle use (Off-Road Vehicles).

The Forest Plan also contains specific standards for Riparian Areas, which include water features (e.g. perennial streams, lakes, and ponds) and the transition zone between the water feature and adjacent terrestrial habitat. Riparian zones include at least 100' from the aquatic feature and can be a greater distance depending on recognizable soil characteristics and distinctive vegetative communities that require free and unbound water. Riparian areas include intermittent streams or those which flow only as a direct response to rainfall or snowmelt events, bogs, marshes, sloughs, potholes, mud flats, springs, wet meadows, seeps and floodplains or side channels of perennial streams. Riparian Area standards, which apply to roads, include the following and may be found in the Forest Plan on pages II-30 and 33:

1) Improvements such as boat ramps, roads and trails that exist or are planned in riparian areas will have surfaces designed to minimize sedimentation (e.g. paving, seeding, or gravelling).

2) Roads that parallel streams will be located at a distance determined by sediment transport models, and outside the 100-year floodplain.

3) Active construction projects will be completed or treated before expected peak runoff times to minimize sediment yield.

4) When funds for road maintenance are limited, roads and drainage structures in riparian zones will be a top priority.

5) Necessary stream course crossings will insure fish passage, non-erosive water velocities and channel stability and insure erosion control on cuts, fills and road surfaces.

6) Eliminate or replace existing structures that are identified as fish barriers or sediment sources.

7) Roads will be located to avoid key riparian habitats such as wallows, bogs and wet meadows unless there is no reasonable alternative. In any case, as much screening, cover and distance as possible will be retained.

8) Road closures will be used to protect riparian habitat and values.

OTHER REGULATORY FRAMEWORK

Factors of consideration for how roads relate to other resources follow the legally mandated processes of the Endangered Species Act, the Clean Water Act, State-adopted Best Management Practices, the Clean Air Act, the National Forest System Land Resource Management Planning Rule, and relevant administrative policy. The ID Team will work to develop opportunities that meet the Forest Plan goals and standards as they relate to the transportation system.

The transportation system legal framework applicable to this project is listed in the Transportation section of the Project File. This list prescribes the authority, objectives, policy, responsibility, and definitions for the cost-effective planning, development, operation, and maintenance of the transportation system.

ANALYSIS AREA

The boundary of the combined Young Creek and Dodge Creek planning sub-units will be used for most of this transportation analysis. The exception is the haul roads that extend into the Sullivan Creek sub-unit to paved or county roads. These haul roads will be analyzed only for any BMP work needed.

Measurement Indicators

Road miles are used to measure and quantify all facets of the transportation analysis.

Reference Conditions/Historical Reference

The first thoroughfare in the Young Dodge Decision Area was the Yahk Trail (original spelling), sometimes called the Yahk-Wild Horse Trail. The trail branched from the Kootenai Trail, traversed up the Yaak River to Dodge Summit, and down Dodge Creek to the Kootenai River where it connected to the Wild Horse Trail. Originally developed by the Native Americans, the trail was probably used some by fur traders in the early 1800s. The first of the Hudson's Bay trading posts in the Tobacco Plains was located at the mouth of Dodge Creek. The Wild Horse gold rush of 1864 in British Columbia brought more traffic to the trail. Miners with their pack trains used the trail to make their way to the gold mines.

The Libby Dam project in the 1960s and early 1970s prompted the relocation of major roads Yaak 92 and West Kootenai 474 to provide access up the west side of the new Lake Koocanusa reservoir from the new Bridge. The road construction was administered by the Army Corps of Engineers and the road jurisdiction was given to Lincoln County. These two arterial roads now provide the primary access to the West Kootenai community and to the Young Creek, Dodge Creek, Sullivan Creek and Boulder Creek drainages.

Road design standards used for road building before 1970 were considerably less than today. Some conservation practices were used, but hydrological Best Management Practices (BMPs) used today were not required then. Many of the major roads were reconstructed in the 1970s and 1980s with design standards similar to today's BMP standards. Installing additional culverts, drain dips, and surface water deflectors make up the majority of the work required to meet current BMPs on the existing roads.

EXISTING CONDITION

Within the Young Dodge Decision Area, there are 273.67 miles of existing road. This total includes private (39.97 miles), State (11.17 miles), County (8.91 miles) and Forest Service (213.62 miles) jurisdictions. National Forest System Roads (NFSR) comprise 198.68 of these miles with 72.98 miles open yearlong, 4.21 miles seasonally restricted and 121.49 miles restricted yearlong. Another 14.94 miles of road with Forest Service jurisdiction were identified as unauthorized roads. Please refer to MAP 3-14 at the end of this chapter for a spatial representation of existing road management.

Transportation Table 3-1 displays information on the existing characteristics of the current Young Dodge road system.

Transportation Table 3-1 Young Dodge Road System Existing Characteristics

Project Area Roads	
Total Miles of All Roads In The Young Dodge Decision Area	**273.67 miles**
National Forest System Roads (NFSR)	198.68 miles
County Roads	8.91 miles
State Roads	11.17 miles
Private Roads	39.97 miles
Unauthorized Roads	14.94 miles
Existing Road Management	
NFSR Restricted Yearlong	121.49 miles
NFSR Open Yearlong	72.98 miles
NFSR Restricted Seasonally 12/1 – 4/30	4.21 miles
Unauthorized Roads Open Yearlong	5.91 miles
Unauthorized Roads Restricted Seasonally	0.84 miles
Unauthorized Roads Restricted Yearlong	8.19 miles
State Roads Open Yearlong	0.26 miles
State Roads Restricted Yearlong	10.91 miles
All Open Roads In the Project Area (State, Private, County & FS)	129.50 miles
All Restricted Roads In the Project Area (State, Private, County & FS)	144.17 miles
Existing Road Standards & Characteristics (NFS Roads)	
Functional Class	
Arterial	0.00 miles
Collector	48.78 miles
Local	149.90 miles
Objective Maintenance Levels	
Maintenance Level 5	0.00 miles
Maintenance Level 4	0.00 miles
Maintenance Level 3	27.41 miles
Maintenance Level 2	51.34 miles
Maintenance Level 1	119.93 miles
Road Surfacing	
Native	166.02 miles
Aggregate	32.66 miles
Bituminous	0.00 miles
Critical Traffic	
4-Wheel Drive	17.27 miles
Pickup Truck	6.40 miles
Log Truck	171.44 miles
Lowboy	3.57 miles
Traffic Service Level	
A	
B	
C	28.52 miles
D	170.16 miles

Open Road Densities (ORDs)

The MAs on Forest Service lands in Young Dodge consist of MA 2, MA 10, MA 11, MA12, MA 13, MA 15 and MA 16. Transportation Table 3-2 describes the ORDs of these Management Areas.

Transportation Table 3- 2 Management Area Open Road Densities

Management Area	Acres	Square Miles	Miles of Open Roads	Miles of Seasonal Road Restrictions	Current ORD	ORD During Restricted Season	Forest Plan ORD Standards
2	2169	3.39	0.00	0	0	N/A	0
10	1409	2.20	2.94	4.21	3.25	1.34	Seasonal Restrictions From 12/1 – 4/30
11	7977	12.46	50.70	0	4.07	4.07	Seasonal Restrictions From 12/1 – 4/30
12	13,223	20.66	16.86	0	0.81	N/A	0.75
13	2753	4.30	5.51	0	1.28	N/A	Local Roads Restricted YL
15 & 16	4683	7.32	4.30	0	0.59	N/A	3.00

In MA 11, the Forest Plan management direction states that motorized access is generally not permitted during the big game wintering period from December 1 through April 30 (Forest Plan Vol 1 p III-45). Currently, there are approximately 18.5 miles of road restricted yearlong in MA 11 and 50.7 miles open yearlong. Of the open 50.7 miles however, approximately 18 miles are needed for yearlong residential access. The remaining 32.7 miles of road are generally impassable to most motor vehicles during the big game wintering period. Present snowmobile use on these roads is minimal.

MA 12 currently exceeds Forest Plan standards. All local roads in MA 12 are currently restricted yearlong and only selected main roads and major through roads remain open.

In MA 13 all roads currently open are collector roads, except for small portions of local roads 7220A and 7211. Although these two roads are categorized as local roads, they are both major through roads. The first 0.18 miles of Road 7211, at its junction with Road 470, begins on the border of MA 13. The road is nearly four miles long and closing the entire road because of the 0.18 miles bordering MA 13 is not warranted. The situation is similar for the two-mile long Road 7220A where it transects the border of MA 13 for 0.13 miles. Instead of closing these roads, other mitigation measures, such as signs and enforcement have been used to protect the old growth snags from being cut for firewood.

Physical Condition of the Roads

The overall condition of the existing National Forest System Roads in the Young Dodge Analysis Area is good. BMPs have been performed on portions of the main roads, but have not been completed for the full length of most roads. The needed BMPs include adding culverts to relieve long ditch sections, installing additional surface drainage structures such as drain dips and surface water deflectors, and other minor work items. These items include cleaning ditches and catch basins, reshaping out-sloped roads, and placing geo-fabric and aggregate to bridge wet areas on roads.

Road maintenance is regularly performed on Roads 303, 470, 7202, 7205, and 7220. Brushing, road grading, slough removal, and ditch cleaning are part of the regular maintenance schedule for these roads. Occasionally, the maintenance crew will perform BMPs. This usually involves adding culverts, surface water deflectors, or drain dips to correct obvious drainage problems. Some of the local roads in the Analysis Area have recently been used for timber sales and brought up to current BMPs.

The only maintenance scheduled for roads that are restricted yearlong is to yearly inspect the road for drainage problems.

Efficiency of the Road System

The existing road system in the Young Dodge Analysis Area was in need of evaluation. The Young Dodge Roads Analysis/Travel Analysis has identified opportunities to provide more efficiency to the road system. These opportunities would provide the minimum road system necessary to meet the resource and recreational needs of the area and would reduce road maintenance costs.

Adding Existing Roads to the National Forest System

The Young Dodge ID Team completed a Roads Analysis/Travel Analyses in the fall of 2006 to identify the minimum necessary road system in compliance with 36 CFR 212. All roads in the Analysis Area were edited to match the 2005/2006 NAIP photo image. Roads that showed up on the photos, but were not in our Transportation Atlas, were inspected on the ground and included in the analyses. As a result, 45 unauthorized roads were identified.

The ID Team analyzed and evaluated any and all resource needs for each existing road, whether they were National Forest System Roads or “Unauthorized Roads”. We did not analyze, or consider as roads, any obvious skid trails or illegally developed roads, for which the Forest Service already has the authority to eliminate traffic.

Twenty unauthorized roads totaling 8.85 miles were determined as needed for the long-term transportation system and are recommended to become National Forest System Roads. Currently, 4.79 miles of these roads are physically closed yearlong and 4.06 miles have been managed as open.

These “Unauthorized Roads” are constructed roads that were not included in the Transportation Atlas. In the late 1970s, the Forest Service began to develop a roads database to account for all Forest Development Roads (FDR), also known as System Roads. The focus was on logging transportation. Existing roads in the Young Dodge Area, especially near the West Kootenai community, were basically ignored while developing the database, for several reasons:

- The road system tributary to the Gateway and Rexford bridges on the Kootenai River had been redirected on new County Roads 474 and Yaak 92 to the new Lake Koocanusa Bridge. This left many of these once major roads ending on the banks of the new reservoir. These displaced FDRs were no longer main system haul routes.
- Much of the area had been heavily logged in the 1940s, ‘50s and ‘60s. Logging opportunities on National Forest System lands were minimal in the West Kootenai area during the 1970s, ‘80s and ‘90s. Therefore, inventorying the roads in this area was a low priority.
- Inventory of the roads for the 2006 Young Dodge Roads Analysis revealed several forest roads that should have been listed as National Forest System Roads, but were not in the INFRA database or the Transportation Atlas when it was declared complete.

The Forest Travel Atlas was deemed complete as of September 30, 2005, as stated in the April 13, 2006 letter concerning real property verification of Forest Service roads. This letter included specific direction for adding or removing roads from the Transportation System, Atlas and INFRA Database. Because these forest roads were not included in the 2005 Atlas, we are now proposing to add them to the transportation system.

36 CFR 212.1 defines a **Forest Road** as a road wholly or partly within or adjacent to and serving the National Forest System that the Forest Service determines is necessary for the protection, administration, and utilization of the National Forest System and the use and development of its resources. A **National Forest System Road** is a forest road other than a road that has been authorized by a legally documented right-of-way held by State, county, or other local public authority. An **Unauthorized Road** is a road that is not designated as a forest road or temporary road and that is not included in a forest transportation atlas.

The unauthorized roads that are proposed as additions to the transportation system are, in fact, existing forest roads that have been determined through a roads analysis to be needed for the protection, administration, and utilization of the National Forest System and the use and development of its resources. They are "unauthorized" only because they were not included in the forest transportation atlas completed in 2005.

Decommissioning Unneeded Roads

The remaining unclassified roads were deemed no longer needed as part of the long-term system and are recommended for decommissioning. The sum of these is 6.09 miles, with 1.43 miles currently open, 0.60 miles under seasonal restrictions, and 4.06 miles that are physically closed or impassable to motorized vehicles due to vegetation.

Twenty existing National Forest System Roads were identified as not needed and are recommended for decommissioning. These roads total 6.16 miles, with 1.41 miles currently open and 4.75 miles restricted yearlong or impassable due to vegetation. With 6.16 miles of NFSR and 6.09 miles of unauthorized roads, the total miles identified for road decommissioning is 12.25 miles.

Placing Roads into Intermittent Stored Service

The analysis identified 35 roads, totaling 27.02 miles, which will not be needed for resource access during the next 10 to 20 years. These roads are typically restricted to public motorized vehicle use yearlong, but they continue to affect water quality and wildlife security, and incur maintenance costs. The ID Team recommends putting them in intermittent stored service to reduce the risk these roads have to watersheds and wildlife security, and to reduce road maintenance costs.

Road Management

The existing road system in the Young Dodge Analysis Area has a good balance of open and restricted roads. Several major roads provide adequate access through the area, looping up the Young Creek drainage and back down the Dodge Creek drainage. Nearly all of the spur roads in the upper elevations of the Analysis Area are restricted yearlong. In contrast, numerous low standard roads in the West Kootenai and C-Branch areas are open to motorized use and are providing users with varying roaded recreational experiences. The ID Team did not identify any significant need to change the management of the roads. Changes will occur with roads recommended for decommissioning, intermittent stored service, or for additions as NFSR, but no other changes in yearlong or seasonal restrictions were identified as needed to meet any resource concerns.

The Young Dodge Travel Analysis identified roads and trails that will allow motorized vehicle use, with the type of vehicle use allowed and the dates or times the use will be allowed. This analysis will be used to help develop the District's Motor Vehicle Use Map to be published in 2009. When the map is published, traffic will only be allowed on designated routes. Motorized vehicle travel will be prohibited on any area, road or trail not designated for use on the map. The recommendations for designated routes are the product of this travel analysis. The travel analysis is not a decision document. The decision for designating routes will also not be a part of the Young Dodge EIS, but will be deferred to the ID Teams and Decision Officer responsible for producing the Motor Vehicle Use Map.

Desired Future Condition

The optimal Young Dodge road system is one that:

- Is safe and responsive to public needs and desires.
- Is affordable and efficiently managed.
- Is in balance with available funding for needed management actions.
- Has a minimal ecological effect on the land.
- Meets land stewardship needs and management objectives.
- Provides a proper balance between the benefits of access and the risk of road-associated effects to the environment.

Actions needed to achieve the optimal road system include:

- Evaluate and determine the minimum road system necessary for resource access.
- Decommission unneeded roads or convert them to other uses, such as trails.
- Bring roads up to BMP standards.
- Regularly monitor all roads for maintenance needs.
- Manage each road according to the Road Management Objective.

With 40 roads identified as no longer needed, 35 roads identified to be placed into intermittent stored service, twenty unauthorized roads identified as need to be added to the National Forest System of Roads, and numerous roads needing BMP improvements, it is apparent that the existing road system in Young Dodge does not meet our desired future condition. The following proposed alternatives and associated effects will address the needed strategies to bring the roads in the Young Dodge Analysis Area closer to the optimal road system.

DIRECT AND INDIRECT EFFECTS

To meet the ***Purpose and Need statement D*** to “Provide a transportation system that provides additional secure habitat for wildlife, reduces impacts to aquatic resources, and insures economical, necessary and safe access to the forest”, as described in Chapter 1, the following strategies were used to develop the action alternatives.

- Bring the roads up to BMP standards to reduce the amount of water and sediment delivered to streams (***Strategy 4***, Chapter 1).
- Decommission roads that are no longer needed (***Strategy 5***, Chapter 1).
- Place roads into intermittent stored service (***Strategy 6***, Chapter 1).

- Add roads currently identified as “unauthorized” to the National Forest Roads System (***Strategy 7***, Chapter 1).
- Reconstruct Road 7176A, which would be the access road to the proposed boat ramp (***Strategy 8***, Chapter 1).

The actions proposed for the strategies listed above are the same for both action alternatives. The direct and indirect effects would also be the same, only differing by quantities. Therefore, the effects will first be analyzed by proposed strategy items and then compared by alternatives.

Proposed BMPs

Maintenance of roads needed to access areas proposed for vegetation management would be designed and performed to meet current BMP standards.

The objectives of BMPs are to reduce the concentration of sub-surface and surface water runoff, minimize road surface erosion, filter ditch water before entering streams, and decrease the risk of culvert failures during peak runoff events. Maintenance work could include culvert installation, replacement of existing culverts with larger culverts, installation of drainage dips and surface water deflectors, placement of rip-rap to armor drainage structures, aggregate surface replacement, aggregate placement to reinforce wet surface areas, ditch construction and cleaning where needed, and surface blading to restore the drainage efficiency of the road surface. These actions, where needed on each road, would bring the roads up to current BMP standards, and would provide benefits to aquatic resources. BMP work would emphasize restoring the natural drainage patterns that were altered during the construction of the roads.

Completing the proposed BMPs would reduce the existing direct and indirect effects these roads have on the watersheds, resulting in beneficial effects to the water quality of the aquatic resources. This work would also benefit the efficiency of the transportation system. Exceptions to these benefits would be minor short-term effects that can be mitigated, such as:

The inconvenience and safety effects to the public user during project activities can be mitigated with proper signing and coordinated radio use.

Any ground-disturbing effects from road maintenance activities would be minimized with construction BMP measures during the execution of the project (i.e. silt fences or seeding).

Road Decommissioning

As described in Strategy 5 of Chapter 1, roads identified by the ID Team as no longer needed for current and future administrative purposes would be removed from the National Forest Road System.

The objective of decommissioning is to remove roads from the landscape. Decommissioned roadbeds are stabilized and restored to a more natural state. Natural drainage patterns that were interrupted when the roads were built are restored. Decommissioning activities could include complete or partial recontouring of the roadbed, removal of culverts and other structures, placement of water bars, out-sloping, stabilizing slopes and fills, seeding, and revegetating or a combination of the above.

Some of these actions may cause short-term effects to streams and water quality because of the ground disturbance activities. However, decommissioning would result in substantial long-term reductions of the effects and risks that the road would continue to pose if left on the landscape.

Approximately 8.67 miles of the proposed 12.25 miles of road decommissioning is within MA 10 and MA 11 winter range. Decommissioning these roads would reduce the disturbance and displacement effects these roads currently have on big game winter range.

Decommissioning roads would also reduce the costs of road maintenance and improve the efficiency of the transportation system.

Intermittent Stored Service

Roads continue to affect water quality and wildlife security, and incur maintenance costs even when restricted yearlong. Placing roads that are not needed for resource management purposes for the next 10-20 years into intermittent stored service can reduce these effects. Treatment activities for intermittent stored service would include removing culverts, restoring stream crossings and natural drainage patterns, out-sloping the road surface, installing water bars, and seeding and fertilizing the roadbed. The road prism would remain on the landscape.

Placing a road into intermittent stored service, rather than decommissioning it, allows the watershed risks posed by the road to be minimized, while the road remains on the National Forest Road System for future use. A decommissioned road is no longer a road and is not to be considered for future use.

Placing 35 roads totaling 27 miles into intermittent stored service would substantially reduce road maintenance costs, reduce road-related effects to water quality, and would help provide for wildlife security.

Proposed Road Construction

Approximately 0.40 miles of Road 7176A would be reconstructed as part of the overall project to install a boat launch in Young Creek Bay. The road would be improved to handle a higher volume of traffic and realigned to resolve existing problems and reduce maintenance costs. The existing road template is primitive and susceptible to rutting, pooling and the development of deep potholes. The native surface, which consists of glacial silts and sands, creates a dust problem in the summer months.

The traffic on this road is increasing as more people are using it to access the makeshift boat mooring area in the bay. There are no prominent drainages along the road, and the risk of effects to streams is minimal. The realignment and reconstruction of this road would eliminate the existing problems and provide for current and future recreational access needs. Road maintenance would be made easier and costs would be reduced with the road realignment and the placement of aggregate.

The proposed road reconstruction would help reduce road maintenance costs and improve access to manage the resource and recreational opportunities of the Young Dodge Analysis Area. This action would directly and beneficially affect the efficiency of the transportation system.

Additions to the National Forest Road System

The unauthorized roads that are proposed as additions to the transportation system are, in fact, existing forest roads that have been determined through a roads analysis to be needed for the protection, administration, and utilization of the National Forest System and the use and development of its resources. They are “unauthorized” only because, by oversight, they were not included in the forest transportation atlas completed in 2005. The effects of not having these needed roads as National Forest System Roads include the lack of any authorized funding to maintain the unauthorized road. Additionally, to reduce road-related effects to other resources, unauthorized roads are generally decommissioned or converted to another use, such as a trail. These existing roads provide the most efficient location for access to timber resources and recreational sites. If they were decommissioned as unauthorized roads, there would be no feasible access to these resources. Since these roads are already on the landscape and generating risk and effects to other resources, adding them to the system would not increase any of these effects. In fact, adding them would allow for funded road maintenance and management that would reduce these existing risks and effects.

Adding these proposed unauthorized roads to the National Forest Road System would complete the minimum road system necessary for efficient access to manage the resource and recreational opportunities of the Young Dodge Analysis Area. This action would directly and beneficially affect the efficiency and practicality of the transportation system.

Alternatives 1, 1M, and 3

Transportation Table 3-3 below lists the proposed road management for the alternatives. The proposed decommissioning, intermittent stored service, unauthorized roads to be added to the National Forest Road System, and proposed reconstruction are identical for Alternatives 1, 1M, and 3. The only difference between the proposed road management of the three alternatives is the road maintenance to meet BMPs within the Project Area. Alternative 1 proposes 100.21 miles of maintenance, Alternative 1M proposes 97.53 miles, and Alternative 3 proposes 97.48 miles.

The direct and indirect effects incurred by road management proposals in Alternatives 1, 1M, and 3 are positive and beneficial to the transportation system, the watersheds, and wildlife resources. Alternative 1 would provide a minor increase in beneficial effects because of the additional 3.47 miles of proposed BMP work, when compared to Alternative 1M, and 2.73 miles more, when compared to Alternative 3. Please refer to MAP 3-15 for a spatial representation of proposed road management for Alternatives 1, 1M, and 3.

Transportation Table 3- 3 Comparing Road Related Actions by Alternatives

Proposed Road Management Actions Alternative 1	
Road Maintenance To Meet Current BMPs Within The Project Area	100.21 miles
Road Maintenance To Meet Current BMPs on Haul Roads Outside The Project Area	16.43 miles
Roads Proposed For Decommissioning	12.25 miles
Roads Proposed For Intermittent Stored Service	27.02 miles
Unauthorized Roads To Be Added To The National Forest Road System	8.85 miles
Roads Proposed For Reconstruction	0.40 miles
Proposed Road Management Actions Alternative 1M	
Road Maintenance To Meet Current BMPs Within The Project Area	97.53 miles
Road Maintenance To Meet Current BMPs on Haul Roads Outside The Project Area	16.43 miles
Roads Proposed For Decommissioning	12.25 miles
Roads Proposed For Intermittent Stored Service	27.02 miles
Unauthorized Roads To Be Added To The National Forest Road System	8.85 miles
Roads Proposed For Reconstruction	0.40 miles
Proposed Road Management Actions Alternative 2	
Road Maintenance To Meet Current BMPs Within The Project Area	0.00 miles
Road Maintenance To Meet Current BMPs on Haul Roads Outside The Project Area	0.00 miles
Roads Proposed For Decommissioning	0.00 miles
Roads Proposed For Intermittent Stored Service	0.00 miles
Unauthorized Roads To Be Added To The National Forest Road System	0.00 miles
Roads Proposed For Reconstruction	0.00 miles
Proposed Road Management Actions Alternative 3	
Road Maintenance To Meet Current BMPs Within The Project Area	97.48 miles
Road Maintenance To Meet Current BMPs on Haul Roads Outside The Project Area	16.43 miles
Roads Proposed For Decommissioning	12.25 miles
Roads Proposed For Intermittent Stored Service	27.02 miles
Unauthorized Roads To Be Added To The National Forest Road System	8.85 miles
Roads Proposed For Reconstruction	0.40 miles

Alternative 2, No Action Alternative

If the strategies to address the Purpose and Need in Chapter 1 are not realized, the desired future condition of the Young Dodge Analysis Area would not be met. All of the proposed road management actions were developed to reduce risks and effects and to achieve the optimal road system. If these actions were not accomplished, the road system would continue to generate risks and effects to water quality, wildlife security, and transportation efficiency. For these reasons, Alternative 2 is the most impactive alternative considered.

CUMULATIVE EFFECTS

The Cumulative Effects Worksheet, located in the Transportation section of the Project File, contains the detailed analysis of all past, current, and reasonably foreseeable activities listed in Tables 3-1 and 3-2 (pp III-2-4). No measurable increase in long-term negative effects would result from the implementation of any proposed or on-going road management activities. It is, however, recognized that most road management activities that provide long-term benefits also create some minor and acceptable short-term effects.

All current, proposed and foreseeable road-related activities would have beneficial cumulative effects to the transportation system, and wildlife, aquatic, and recreational resources. These activities would also reduce the risks and effects created by past road construction and management.

Vegetation Management

Timber sales typically require any needed road improvements in order to move a road into BMP compliance. Precommercial thinning, commercial thinning, prescribed burning, blowdown salvage, and other commercial vegetation product removal do not generally require road improvement work because of the dispersed, short-term, or low impact nature of these activities on forest roads. Vegetation management activities, overall, have a beneficial effect on the road system.

Cattle Grazing

Cattle on higher volume roads continue to be a safety concern. However, cattle grazing does not have a measurable impact to road function.

Noxious Weed Treatment

Traffic continues to spread noxious weeds along roads. The treatment program is effective along roadways, but must continue to prevent new infestations from developing along roadways. This program has beneficial effects to the road system.

Fire Suppression

Fire suppression and related activities will occur in the future. Wildfires that escape initial attack could impact the road system in the short-term. Roads that are impassable prior to a fire start may be opened with heavy equipment. This can cause short-term impacts to the roads. Following the suppression actions, these roads are restored to a condition that allows proper drainage.

Road Management

Deferred and regular, scheduled maintenance activities continue to maintain or improve road conditions within the Analysis Area.

Public Use

These activities generally have little effect on the road system. Traffic during wet periods may cause rutting and create surface drainage problems. Firewood gathering can plug road ditches and/or culverts when this activity is conducted outside the terms of the firewood permit. Other public use activities occurring throughout the year have a negligible effect to the road system.

Recreation Maintenance

These activities generally do not influence the road system. Maintenance typically occurs on trails or existing structures.

Special Uses

Special use permits (road use, water lines, utility lines, fish weir, fire hall, etc.) and outfitter/guide permits have not been identified as having a measurable effect on the road system. These activities have a low impact to road resources due to their dispersed nature. Cumulatively, there would be no effect.

Activities on Private Land

New residential construction would increase traffic on forest roads. These increases are gradual over time and not generally impactive unless hauling over wet roads occurs during periods of construction.

Other Agency

Montana Fish, Wildlife, and Parks is proposing to thin approximately fifty acres of trees in the Wildlife Management Area. The effect from this is similar to the effects described above in the "Vegetation Managment" section above.

Overall, the above described activities would have a neutral or beneficial impact to the road system. Management activities that require heavy use of roadways collect monies for maintenance activities that improve road function and reduce road-related impacts to other resources. Other activities are low impact and dispersed in nature and outside of wet periods, generally have very little impact on road systems.

CONSISTENCY WITH REGULATORY FRAMEWORK

The process of this analysis and the road management proposals listed in this document comply with all laws, executive orders, Forest Service directives, memorandums of understandings, and with the current Forest Plan goals, objectives, guidelines and standards.

RANGE

INTRODUCTION

The Young Dodge Decision Area contains one range allotment, the West Kootenai allotment, which lies almost entirely within the boundary of the Young Dodge Decision Area. The Analysis Area for effects to the range resource will be the West Kootenai allotment. A map of the allotment in relation to the Young Dodge Decision Area is located in the Project File.

The West Kootenai range allotment was developed in 1958 from a combination of smaller ones established about 1950, and has been active since. It consists of about 22,300 acres divided into several pastures. The allotment extends from the US/Canada border on the north side to the Rexford Face road system on the south end, and from the Purcell range crest on the west side to Koocanusa Reservoir on the east. About 5270 acres within the boundary of the allotment are non-federal lands (State and private ownership). The topography ranges from rounded mountain ridges on the west side to low-relief hills and alluvial terraces along the reservoir on the east side. Elevations range from about 2500 feet along the Koocanusa Reservoir to about 6000 feet. The allotment has a number of improvements such as drift fences, water source protection sites (springs, ponds), and cattle guards.

Historically, cattle forage was provided by roadside grasses, grasses under open coniferous timber, or by harvest-created openings. Available forage varied from year to year. In more recent years, forage has also been provided by the 2000 Young J Fire (mostly along roads 303 and 303J), and by urban interface fuel reduction projects that have opened up timber stands and increased the production and availability of grasses.

EXISTING CONDITIONS AND TRENDS

Most of the allotment is covered by mixed coniferous forests in various successional stages. Cattle use still occurs on roadsides, open coniferous stands and early successional stands (up to about 20 years). Currently about 156 acres are 0-2 years old, providing low but increasing forage availability. About 2319 acres are 3-10 years old, providing good forage availability. Another 1925 acres are 11-20 years old, still providing forage but starting to lose availability due to growing conifer trees that shade out forage and grass species. About 1109 acres are 20-25 years old, probably providing minor amounts of forage in the remaining open areas. Generally, stands over 25 years old are assumed to not provide measurable forage. These acres are based solely on past harvest activity; some of these acres most likely do not provide forage and some acres not included probably do provide forage based on site-specific conditions of access, water, slope, and vegetation. In addition, most of the roads in the allotment provide roadside grasses that are readily grazed by cattle.

Transitional grazing in the upper pastures (upper Young and Dodge Creek above Arnold’s Pond and Alkali Lake) has been decreasing as previously harvested units have reforested. At the same time, urban interface fuel reduction projects in the south and east portion of the allotment have increased both forage production and availability. Grazing utilization of existing forage is generally light, and the overall condition of the range is good. Cattle tend to prefer slopes less than 25%, so topography often limits actual utilization of available forage. Distance from available water may also limit use of available forage.

The most recent update to the West Kootenai Allotment Management Plan, including current grazing capacity estimates and range suitability, was completed in December 2006. The current and active permit allows up to 225 cow/calf pairs to be let on the allotment from May 15 through September 30 of each year, however, actual use is less than the permit allows. Approximately 70 cow/calf pairs and 70 yearlings currently graze within the Decision Area. The current grazing capacity of 1001 animal unit months

(AUMs) for the allotment is based on miles of roadside grazing and other known forage-providing areas (e.g. Green's Basin). The current permitted AUMs for 225 cow/calf pairs is 1012 AUMs.

There are two management concerns associated with this range allotment. First, cattle have traditionally concentrated in a few areas (Arnold's Pond, Dodge Creek, other water sources) and have caused some minor resource damage. Resource monitoring and subsequent cattle management over the past 15 years has greatly improved the damaged areas (see the West Kootenai Range Allotment Plan in the Project File). Although conditions are much improved, continued monitoring is needed to ensure that conditions do not deteriorate in the future. Second, permit cattle sometimes drift onto unfenced private lands, prompting landowner complaints. Permittees have been very responsive in the past to such complaints and have promptly moved their cattle. Landowners have been reminded that they are responsible to fence cattle out and maintain those fences under the Open Range Law (Montana Code 81-4-203); however, cattle access to private lands continues to be an issue.

The current permit is expected to continue operating through the next ten years, with about the same number of cattle (less than the permit actually allows).

ANALYSIS OF DIRECT AND INDIRECT EFFECTS

Effects of Alternative 2 (No Action)

Alternative 2 would not propose any management activity at this time. Roadside forage would continue to be available to cattle, but over time, past open harvest units would trend toward a decrease in cattle forage production as trees shade out the grasses. The estimated 1109 acres that are currently 20-25 years old would move out of forage production; the 1925 acres that are currently 11-20 years old would decrease forage production or even move out of production capability over the next 10 years. Without "replacement" forage created by management activities, forage availability would trend downward. Because the current grazing utilization is light, the allotment is likely to support the permitted number of cattle over the next 10-year period. However, eventually, the loss of a regular influx of newly-created openings that provide forage could result in long-term decreased carrying capacity and subsequent reduction of permitted range cattle.

If Alternative 2 was implemented, the long-term decrease in available forage could also result in increased cattle drift onto unfenced private lands, where agricultural fields provide forage. Complaints from landowners would be expected to increase over time.

Effects Common to All Action Alternatives

Vegetation management activities proposed in the action alternatives would create new forage opportunities at varying levels. Regeneration-type treatments, such as seed tree and clearcut methods, would open stands the most and provide the most opportunity for forage production. Intermediate harvest treatments, such as commercial thinning and prescribed burning that reduces understory regeneration, would provide light-to-moderate increases in forage production. Prescribed fire (with or without mechanical pre-treatment) is often used to maintain open forest conditions in the lower elevation, warm/dry forests. The open conditions often provide range forage prior to any treatments. Prescribed fire may result in an initial decrease in forage, followed by an increase. Generally, it takes a few years following prescribed burning for grasses and forbs to reach optimal forage production.

Even though forage may increase, the ability of cattle to utilize new forage may be tempered by other site-specific factors such as slope, access, and available water.

Alternatives 1, 1M, and 3 propose roadside salvage units and a post and pole unit. Typically, these types of treatments have no effect on range resources.

Alternatives 1, 1M, and 3 propose treatments that reduce ground-level vegetation adjacent to unfenced private lands. Reduced understory trees and brush increase the potential for cattle to move off roadways and into the treated stands. This may result in increased cattle drift onto private lands.

Effects of Alternative 1 (Proposed Action)

Based on access, treatment type and slope, Alternative 1 is expected to improve forage on about 6540 acres over the next 10 years. This includes about 2047 acres of slight increased forage (prescribed burns only), about 2622 acres of moderate forage increase (prescribed burns with mechanical pre-treatment, commercial thinning), and about 1871 acres of high increase in forage (regeneration treatments). Refer to Chapter II for specific unit information. The same decreases in the 3034 acres of existing forage described for Alternative 2 (No Action) would still occur as stands matured, however, unlike Alternative 2, Alternative 1 would "replace" that decline with new forage. This would benefit the range resources.

Alternative 1 has both regeneration and intermediate harvests, as well as prescribed burning adjacent to private lands. This has the potential for cattle drift onto unfenced private lands. Regeneration harvest provides the most new forage and most of this proposed treatment in Alternative 1 is located in the upper pastures of the allotment. This may hold cattle in the upper pasture longer and help prevent premature cattle drift into the lower pasture and private lands. The lower pastures have more of the intermediate harvest and prescribed fire treatments, which would also provide forage.

Effects of Alternative 1M

Based on access, treatment type and slope, Alternative 1M is expected to improve forage on about 6101 acres over the next 10 years. This includes about 2040 acres of slightly increased forage (prescribed burns only), about 3101 acres of moderate forage increase (prescribed burns with mechanical pre-treatment, commercial thinning, mosaic harvests), and about 960 acres of high increase in forage (regeneration treatments). Refer to Chapter II for specific unit information. The same decreases in the 3034 acres of existing forage described for Alternative 2 (No Action) would still occur as stands matured, however, unlike Alternative 2, Alternative 1M would "replace" that decline with new forage. This would benefit the range resources.

Alternative 1M has both regeneration and intermediate harvests, as well as prescribed burning adjacent to private lands. Regeneration harvest provides the most new forage and most of this proposed treatment in Alternative 1M is located in the upper pastures of the allotment. This may hold cattle in the upper pasture longer and help prevent premature cattle drift into the lower pasture and private lands. The lower pastures have more of the intermediate harvest and prescribed fire treatments, which would also provide forage.

Effects of Alternative 3

Alternative 3 is expected to improve forage on about 5216 acres over the next 10 years. This includes about 1719 acres of slightly increased forage (prescribed burns only), about 1879 acres of moderate forage increase (prescribed burns with mechanical pre-treatment, commercial thinning), and about 1618 acres of high increase in forage (regeneration treatments). Refer to Chapter II for specific unit information. The same decreases in the 3034 acres of existing forage described for Alternative 2 (No Action) would still occur as stands matured. Alternative 3 is similar to Alternative 1 in effects to forage availability, only to a lesser degree. Alternative 3 would have slightly less forage production than Alternative 1 over the next 10 years. Most of the regeneration harvest is in the upper pastures as well. Range resources would still benefit.

Alternative 3 has less prescribed burning along private land boundaries than Alternative 1. There would be less potential for cattle drift onto private lands with Alternative 3.

The main difference between Alternative 1 and Alternative 3 is the amount of new available forage. The currently permitted cattle do not fully use all available forage now. Increases in forage availability above what is now utilized may increase carrying capacity, but may not necessarily be used by cattle. Increased forage would be beneficial for other species that use forage, such as big game.

ANALYSIS OF CUMULATIVE EFFECTS

The Cumulative Effects Worksheet, located in the Range section of the Project File, contains the detailed analysis of all past, current, and reasonably foreseeable activities listed in Tables 3-1 and 3-2 (pp III-2-4). Activities identified to have a measurable cumulative effect to the range resource are discussed below.

All past actions listed in Appendix 5, in addition to the roads and trails, private and state land activities, were considered to be relevant to the cumulative effects of all actions in the Young Dodge Analysis Area. Based on past monitoring of range conditions, all laws, regulations, and policies regarding the range resource would be protected under the implementation of any of the action alternatives. Below is the rationale for this conclusion.

Vegetation Management

Past actions that have created the existing vegetative conditions for allotment forage were evaluated by age (1-2 years old, 3-10 years old, 11-20 years old, and over 20 years old. These numbers were used to assess when existing forage would transition back to forest habitats. This loss of forage would be replaced through the proposed activities from Alternatives 1, 1M, or 3. Alternative 2 would not replace any forage production lost in the transition back to forest habitats. The effects to forage production were evaluated based on the sustained level of forage over time (that is, forage created or improved to replace forage dropping out). The action alternatives would have a positive cumulative effect for range; however, Alternative 2 would have a negative cumulative effect on range due to the lack of creation or maintenance of existing forage areas. The reasonably foreseeable actions would add negligible amounts of forage to the allotment based on the types and acreages of management.

Fuel Reduction Activities

Prescribed burning creates new and/or improved forage similar to timber harvest. The action alternatives would increase forage availability in the allotment. Alternative 2 would not add any forage production to the allotment. The reasonably foreseeable actions from fuel reduction activities would add forage to the allotment for up to 20 years.

Livestock Grazing

The cattle allotment would continue to be active in the future and is currently underutilized. This would continue under all alternatives and the reasonably foreseeable actions for the next 20 years.

Noxious Weed Control

Noxious weed control has a beneficial effect to cattle grazing through reduction of poisonous or invasive (replacing native species) plants. The action alternatives have the potential to increase noxious weed spread through ground-disturbing activities, making control more difficult. Design criteria for ground disturbing activities would minimize the spread of noxious weeds in both the action alternatives and the reasonably foreseeable actions. Alternative 2 would have no negative effect on noxious weed control efforts.

Fire Suppression

Fire suppression and related activities will occur in the future. Wildfires that escape initial attack could provide additional forage opportunities as long as other factors such as slope and available water were conducive to cattle use. Due to the unpredictable nature of wild fires, effects to range resources are difficult to quantify. The action alternatives and reasonably foreseeable actions would lessen the risk of large-scale fire suppression operations occurring. Alternative 2 would not lessen this risk.

Road Management

The existing road system does and will continue to provide forage for range cattle. Under the action alternatives, road maintenance actions such as road blading, in addition to the proposed activities, could temporarily reduce roadside grasses, but it is not expected to create long-term adverse effects to range cattle or forage availability. Road restrictions reduce everyday use of roads, which allows more forage to grow, and generally benefits range cattle. Decommissioning and intermittent stored service activities would have negligible effects to forage production, as most of these roads are brushed in and offer little for livestock grazing. Alternative 2 would not change anything over the existing condition.

Recreation Management

These activities generally have no effect on range cattle. Cattle are not known to use trails in the Decision Area.

Public Use (firewood gathering, hunting, trapping, fishing etc.)

These activities generally do not influence range cattle. All alternatives would have minimal effect on range cattle due to the small amount of interaction these activities have with range cattle. When reasonably foreseeable actions are factored in, there is still no measurable effect to range cattle.

Special Uses

Special use permits (road use, water lines, utility lines, fish weir, fire hall, etc.) and outfitter/guide permits have not been identified as having an effect on range cattle. Roads can facilitate cattle movement onto private land; however, that effect is independent of the special use permit because the road would be available to cattle regardless of the permit. Cumulatively, there would be no effect.

Activities on Private Land

New residential construction would not affect range cattle, but new road construction on private lands could increase cattle access to private lands/pastures. Proposed and reasonably foreseeable fuel reduction activities in the low eleveation urban interface may cumulatively increase the potential for private land cattle trespass as more land is treated and opened up, encouraging cattle to drift farther into the forested lands, including onto private lands. Landowners still have the responsibility to prevent cattle trespass by fencing off their property, per Montana's Open Range Law.

Cumulatively, the action alternatives, combined with the reasonably foreseeable actions would provide ample forage for the next 20 years for cattle within this range allotment. Alternative 2 would not provide any additional forage. Forage production would decline to a point where resource damage may occur without a change in management through reduced numbers, range improvement projects, or future vegetation management.

Consistency with Regulatory Framework

The Kootenai Forest Plan has a goal to "provide forage to meet all anticipated demand for domestic livestock grazing (USDA Forest Service 1987 II-2). Over time, Alternative 2 would not be consistent with this goal. Alternatives 1, 1M and 3 would both contribute to this goal by providing a continued influx of forage-producing treatments to meet grazing needs through time.

There are no other laws or regulations applicable to range resources.

ECONOMICS

INTRODUCTION

The management of the Kootenai National Forest (KNF) has the potential to affect local economies. People and economies are an important part of the ecosystem. Use of resources and recreational visitation to the Forest generate employment and income in the surrounding communities and counties and generate revenues that are returned to the federal treasury.

This section presents concepts used to delineate an affected area and methods used to analyze the economic effects of the project, including the project feasibility, financial efficiency, and economic impacts. Project feasibility and financial efficiency relate to the costs and revenues of doing the action. Economic impacts relate to how the action affects the local economy in the surrounding area.

REGULATORY FRAMEWORK

The preparation of NEPA documents is guided by CEQ regulations for implementing NEPA [40 CFR 1500-1508]. NEPA requires that consequences to the human environment be analyzed and disclosed. The extent to which these environmental factors are analyzed and discussed is related to the nature of public comments received during scoping. NEPA does not require a monetary benefit-cost analysis. If an agency prepares an economic efficiency analysis, then one must be prepared and displayed for all alternatives [40 CFR 1502.23].

OMB Circular A-94 promotes efficient resource use through well-informed decision-making by the Federal Government. It suggests agencies prepare an efficiency analysis as part of project decision-making. It prescribes present net value as the criterion for an efficiency analysis.

The development of timber sale programs and individual timber sales is guided by agency direction found in Forest Service Manual (FSM) 2430. Forest Service Handbook (FSH) 2409.18 guides the financial and, if applicable, economic efficiency analysis for timber sales.

ANALYSIS AREA

The Analysis Area for the efficiency analysis is the Project Area. All costs and revenues associated with the project decision were included.

Timber management activities within the Project Area have the potential to impact the economic conditions of local communities and counties. To estimate the potential effect on jobs and income, a zone of influence (or impact area) was delineated. Counties were selected based on commuting data suggesting a functioning economy and where the timber is likely to be processed (log flows). Recent data on log flows from the KNF was provided by the University of Montana's Bureau of Business and Economic Research. The zone of influence for this project is comprised of Lincoln, Sanders, and Flathead counties in Montana and Boundary and Bonner counties in Idaho.

AFFECTED ENVIRONMENT

The combination of small towns and rural settings, along with people from a wide variety of backgrounds, provide a diverse social environment for the geographical region around the Kootenai National Forest. Local residents pursue a wide variety of life-styles, but many share a common theme, an orientation to the outdoors and natural resources. This is reflected in both vocational and recreational pursuits including employment in logging and milling operations, outfitter and guide businesses, hiking, hunting, fishing, camping and many other recreational activities.

Timber, tourism, and agricultural industries are important to the economy of local areas. Despite the common concern for, and dependence on, natural resources within the local communities, social attitudes vary widely with respect to their management. Local residents hold a broad spectrum of perspectives and preferences ranging from complete preservation to maximum development and utilization of natural resources.

A comprehensive socio-economic analysis was recently completed for the KNF. See the document "Social and Economic Systems: Conditions and Trends" (available at http://fs.usda.gov/Internet/FSE_DOCUMENTS/fsm91_056343.pdf) (Russell et al 2006). This document provides a description of the employment, income and social composition of the counties comprising the Analysis Area and the impact on counties from management of the KNF. This analysis indicates the counties within the analysis area are affected by timber management on the forest.

The collapse of the U.S. housing industry and the related global financial crises has had a large negative impact on the Montana and Idaho forest products industry. With declines in housing and generally weakening demand, lumber prices have dropped about 35 percent from 2005 to 2008 (Morgan and Keegan 2009). Availability of stumpage is still important to industry to help ride out the current market situation. There is local demand for stumpage off the Forest, as evidenced by the amount of timber sales sold on the Kootenai in 2009. All sales that were offered in 2009 were sold with strong competition. There continues to be demand for stumpage, although at reduced prices.

METHODOLOGY

Four measures are appropriate for the economic analysis: project feasibility, financial efficiency, economic efficiency (if needed), and economic impacts. These measures are described below, including methodologies.

Project feasibility is used to determine if a project is feasible – will it sell, given current market conditions. It relies on the Region 1 Transaction Evidence Appraisal (TEA) System. The TEA uses regression analysis of recently sold timber sales to predict bid prices. The most recent appraisal model for the area of interest was used to estimate the stumpage value (expected high bid resulting from the timber sale auction) for the timber project. The estimated stumpage value for each alternative was compared to the base rates (revenues considered essential to cover regeneration plus minimum return to the federal treasury) for that alternative. The project is considered to be feasible if the estimated stumpage value exceeds the base rates. If the feasibility analysis indicates that the project is not feasible (estimated stumpage value is less than the base rates), the project may need to be modified. The infeasibility indicates an increased risk that the project may not attract bids and may not be implemented.

Financial efficiency provides information relevant to the future financial position of the program if the project is implemented. Financial efficiency considers anticipated costs and revenues that are part of Forest Service monetary transactions. Present net value (PNV) is used as an indicator of financial efficiency and presents one tool to be used in conjunction with many other factors in the decision-making process. PNV combines benefits and costs that occur at different times and discounts them into an amount that is equivalent to all economic activity in a single year. A positive PNV indicates that the alternative is financially efficient.

Many of the costs and benefits associated with a project are not quantifiable. For example, the benefits to wildlife from underburning to stimulate browse and reduced fuel loadings, are not quantifiable. These costs and benefits are described qualitatively, in the individual resource sections of this document. Title 40, Code of Federal Regulations for NEPA (40 CFR 1502.23) indicates "For the purposes of complying with the Act, the weighing of the merits and drawbacks of the various alternatives need not be displayed in a monetary cost-benefit analysis and should not be when there are qualitative considerations."

Management of the forest is expected to yield positive benefits, but not necessarily financial benefits. Costs for various vegetation, recreation, wildlife, road and burning activities are based on recent experienced costs and professional estimates. Non-harvest related costs are included in the PNV analysis, but they are not included in appraised timber value.

Economic impacts are used to evaluate potential direct, indirect and cumulative effects on the economy. Economic impacts are estimated using input-output analysis. Input-output analysis is a means of examining relationships within an economy, both between businesses and between businesses and final consumers. It captures all monetary market transactions for consumption in a given time period. The resulting mathematical representation allows one to examine the effect of a change in one or several economic activities on an entire economy, all else constant. This examination is called impact analysis. IMPLAN (Impact Analysis for Planning) translates changes in final demand for goods and services into resulting changes in economic effects, such as labor income and employment of the affected area's economy. The IMPLAN modeling system allows the user to build regional economic models of one or more counties for a particular year. The regional model for this analysis used the 2002 IMPLAN data.

The economic impact effects are measured by estimating the direct jobs and labor income generated by the 1) processing of the timber volume from the project, and 2) dollars resulting from any restoration activities of the project into the local economy affected by the treatments proposed. The direct employment and labor income benefit employees and their families and therefore directly affect the local economy. Additional indirect and induced, multiplier effects (ripple effects) are generated by the direct activities. Together the direct and multiplier effects comprise the total economic impacts to the local economy. The data used to estimate the direct effects from timber harvest is information provided by University of Montana's Bureau of Business and Economic Research. The economic effects tied to restoration activities and the multiplier effects (of both timber harvest and restoration activities) were estimated using IMPLAN.

Potential limitations of these estimates are the time lag in IMPLAN data and the data intensive nature of the input-output model. Significant changes in economic sectors since the latest data for IMPLAN have been adjusted using information from the University of Montana's Bureau of Business and Economic Research.

ENVIRONMENTAL CONSEQUENCES

Project Feasibility

The estimation of project feasibility was based on a transaction evidence appraisal, which took into account logging system, timber species and quality, volume removed per acre, lumber market trends, costs for slash treatment, and the cost of specified roads, temporary roads and road maintenance. The estimated high bid was compared to base rates (revenues considered essential to cover regeneration plus minimum return to the federal treasury). The estimated high bid and base rates for each alternative are displayed in Economic Table 3-1. Given the predicted high bids and the base rates, all alternatives are feasible.

The predicted high bid is the basis for the timber revenue estimate. The actual timber value will depend on the market when the timber is sold, and may be higher or lower than the predicted high bid. The analysis included a relatively low Western Wood Products Association (WWPA) average value per thousand board feet (MBF).

Financial Efficiency

The financial efficiency analysis is specific to the timber harvest and ecosystem management activities associated with the alternatives (as directed in Forest Service Manual 2400, Timber Management and guidance found in the Forest Service Handbook 2409.18). Costs for sale preparation, sale administration, regeneration, and ecosystem restoration are included. All costs, timing, and amounts were developed by the specialists on the project's interdisciplinary team. The expected revenue for each alternative is the corresponding predicted high bid from the transaction evidence appraisal equation. The present net value (PNV) was calculated using Quicksilver, a program for economic analysis of long-term, on-the-ground resource management projects. A four percent discount rate was used over the 6-year project lifespan (2010-2015). For more information on the values or costs, see the Project File.

This analysis is not intended to be a comprehensive benefit-cost or present net value analysis that incorporates a monetary expression of all known market and non-market benefits and costs that is generally used when economic efficiency is the sole or primary criterion upon which a decision is made. Many of the values associated with natural resource management are best handled apart from, but in conjunction with, a more limited benefit-cost framework. These values are discussed throughout this document, for each resource area.

Changes to resources like fisheries and wildlife habitats are further discussed in the corresponding sections of this FSEIS. Fisheries and wildlife will not be described in this section in financial or economic terms. Recreation was also not included in the financial efficiency analysis. Projects to improve forest health and reduce fuel loading through burning were included in the economic efficiency analysis, but no revenue is considered in the analysis for these projects. These projects may be funded by some means other than the timber sale.

Planning costs (NEPA) were not included in any of the alternatives since they are sunk costs at the point of alternative selection.

Economic Table 3-1 summarizes the project feasibility and financial efficiency for each alternative. Because all costs of the project are not related to the timber sale, two PNVs were calculated. One PNV indicates the financial efficiency of the timber sale, including all costs and revenues associated with the timber harvest and required design criteria. A second PNV includes all costs for each alternative, including other activities that are non-timber harvest related (road storage, burning to reduce fuels, etc.). Economic Table 3-1 indicates that all Alternatives are financially inefficient for the timber harvest and required design criteria, as well as for all non-timber harvest activities. Of the action alternatives, Alternative 1M has the highest PNV for the timber harvest. Alternative 3 has the highest PNV for the timber harvest and non-timber harvest activities.

A reduction of financial PNV in any alternative as compared to the most efficient solution is a component of the economic trade-off, or opportunity cost, of achieving that alternative. The No Action Alternative would not harvest, plant trees, enhance wildlife habitat, implement BMPs on haul routes, return fire to the landscape or take other restorative actions and, therefore, incurs no costs. As indicated earlier, many of the values associated with natural resource management are non-market benefits. These benefits should be considered in conjunction with the financial efficiency information presented here. These non-market values are discussed in the various resource sections found in this document.

When evaluating trade-offs, the use of efficiency measures is one tool used by the Decision Maker in making the decision. Many things cannot be quantified, such as effects on wildlife, impacts on local economies, and restoration of watersheds and vegetation. The Decision Maker takes many factors into account in making the decision.

Economics Table 3- 1 Project Feasibility and Financial Efficiency Summary (2009 dollars)

Category	Measure	Alternative 2	Alternative 1	Alternative 1M	Alternative 3
Timber Harvest Information	Acres Harvested	0	2535	2115	2420
	Total Volume Harvested (CCF)	0	19,502	15,994	18,112
	Base Rates ($/CCF)	N/A	$36.52	$36.52	$36.52
	Predicted High Bid ($/CCF)	N/A	$60.25	$58.55	$58.61
	Total Revenue	$0	$1,174,995	$1,540,531	$1,061,544
Timber Harvest and Required Design Criteria	PNV	$0	-$198,670	-$170,488	-$175,932
Timber Harvest and Other Planned Activities	PNV	$0	-$1,781,138	-$1,540,531	-$1,482,410

Economic Impact Effects (Jobs and Labor Income)

Timber production from this proposed KNF project would have direct and indirect effects on local jobs and labor income. The Forest used an input-output model, IMPLAN (Impact Analysis for Planning) to estimate effects on employment and labor income within the zone of influence (impact area).

For timber harvest, the direct employment and labor income response coefficients (e.g., jobs and labor income per million cubic feet) were derived by the University of Montana's Bureau of Business and Economic Research. The indirect and induced multiplier effects were estimated using the IMPLAN model for the economic impact area.

For restoration and reforestation activities, the direct, indirect, and induced effects were derived using IMPLAN. The resulting direct, indirect, and induced employment and labor income coefficients have been incorporated into a spreadsheet developed by the Regional Economist for the USFS, Northern Region.

The analysis calculated the jobs and labor income associated with timber harvest, reforestation, and restoration activities. In order to estimate jobs and labor income associated with timber harvest, the timber harvest levels were proportionally broken out by product type for each alternative (see Economic Table 3-2). In order to estimate jobs and labor income associated with reforestation and restoration activities, expenditures for these activities were developed for each alternative (see Economic Table 3-3).

Economics Table 3-2 Proportion Timber Harvest by Product Type by Alternative in Percent

Product Type	Alternative 2	Alternative 1	Alternative 1M	Alternative 3
Sawmills	0	0.85	0.85	0.85
Log Homes	0	0	0	0
Post and Poles	0	0.15	0.15	0.15
Pulp	0	0	0	0

Economics Table 3-3 Reforestation and Other Restoration Activity Expenditures by Alternative over an eight-year period (2009 dollars) (does not include overhead costs)

Reforestation/ Restoration Activity	Alternative 2	Alternative 1	Alternative 1M	Alternative 3
Weed Treatment	0	$55,000	$55,000	$55,000
Tree Planting	0	$286,800	$222,900	$242,700
Burning	0	$529,100	$526,420	$339,780
Road Decommissioning	0	$25,050	$25,050	$25,050
Road Storage	0	$23,100	$23,100	$23,100
Total	**0**	**$919,050**	**$852,470**	**$685,630**

Economic Table 3-4 displays both direct and total estimates for employment (part and full-time) and labor income that may be attributed to each alternative. Since the expenditures occur over an eight-year period, the estimated impacts of jobs and labor income would be spread out over the life of the project. Most of the timber harvest and wood processing jobs would occur over the first four years of the project. These are not new jobs or income, but rather jobs and income that can be attributed to this project.

Economics Table 3-4 Total Employment and Income (2009 dollars) Over the Life of the Project

Analysis Item	alternative 2	Alternative 1	Alternative 1m	alternative 3
Direct Employment (persons)	0	160	136	139
Total Employment (persons)	0	324	272	290
Direct Labor Income	0	$4,274,300	$3,599,100	$3,799,000
Total Labor Income	0	$8,336,200	$6,953,500	$7,530,800

Definitions:

1. Employment is the total full- and part-time wage, salaried, and self-employed jobs in the region.

2. Labor income includes the wages, salaries and benefits of workers who are paid by employers and income paid to proprietors.

Estimates in Economic Table 3-4 indicate that Alternative 1 would maintain the highest number of jobs and labor income with total employment at 324 persons and total labor income being $8.3 million dollars. Alternatives 1M and 3 maintain fewer jobs and labor income. Alternative 2 maintains no jobs or income because there are no activities associated with this alternative.

The analysis assumes the timber volume processed would occur within the Kootenai zone of influence. However, if some of the timber were processed outside the region, then a portion of the jobs and income would be lost by this regional economy.

CUMULATIVE EFFECTS

Management of the Kootenai National Forest has an impact on the economies of local counties. However, there are many additional factors that influence and affect the local economies, including changes to industry technologies, management of adjacent national forests and private lands, economic growth, and international trade.

Ongoing and reasonably foreseeable projects that may affect local economies include the following:

Vegetation Management

Cumulative economic effects would be seen within the local community as a result of the foreseeable actions, which result from timber sales. Planting, post harvest exams, reforestation surveys, purchaser piling, road resurfacing, road maintenance, and road decommissioning would all provide additional employment and income opportunities to the community and surrounding areas.

Road Management

Road maintenance would provide jobs and other economic benefits to the local economy. The Forest Service utilizes private contractors to perform maintenance activities such as road blading, cleaning ditches and culverts, and installing culverts. This activity would have a beneficial cumulative effect.

Recreation Maintenance

Maintenance of trails and developed and dispersed recreation sites would provide jobs and other economic benefits to the local economy. This would have a beneficial cumulative effect.

Special Uses

Outfitter/guides would contribute to the local economy by providing jobs and other economic benefits including payments for lodging (for non-local clients), gasoline, food, meals, and other items. This would have a beneficial cumulative effect.

Public Use

Recreational use would provide indirect economic benefits to the local economy. These benefits would include payments for lodging, gasoline, food, meals, and other items. These activities would have a beneficial cumulative effect.

Private Property

The sale of timber on private lands near the Project Area will have a positive impact on the local economy, maintaining jobs and labor income in the surrounding counties. Other activities on private land may provide jobs and other economic benefits to the local economy. These would have beneficial cumulative effects.

For the Young Dodge project, the jobs and labor income associated with timber harvest, restoration, and reforestation activities in the action alternatives would contribute to the stability of the local economy during the life of the project and also for the future.

CONSISTENCY WITH REGULATORY FRAMEWORK

Forest Plan

One of the Forest Plan goals is to "Provide a sustained yield of timber volume responsive to national and regional needs, scheduled to encourage a stable base of economic growth in the dependent geographical area" (USDA Forest Service 1987a II-1). The Action Alternatives offer varying levels of commercial timber and are consistent with this Forest Plan goal. Alternative 2 would not be consistent with this goal.

Other Laws and Regulations

The Forest Service Manual contains direction regarding economic analysis to (1) conduct the appropriate level of analysis commensurate with the complexity of issues, scope of decision, and significance of expected results; (2) to select cost-effective methods of conducting economic and social impact analyses to ensure that the degree of analysis is commensurate with the scope and complexity of the proposed action; and (3) to determine the scope, appropriate level, and complexity of the economic and social analysis needed. All Alternatives are consistent with that direction.

CULTURAL RESOURCES

INTRODUCTION

People began occupying the northern Rocky Mountains following the retreat of the last glaciers. This region has a rich history of use by Native Americans, explorers, fur traders, and trappers, miners, and farmers. The District has a role to play in preserving the history of these peoples who may have used and occupied the Decision Area.

EXISTING CONDITIONS AND TRENDS

The Analysis Area for Cultural Resources is the same as the Decision Area.

The Decision Area contains steep mountain slopes adjacent to permanent flowing water. The Decision Area has a low-to-high probability of containing cultural resources. Valley bottoms and ridge tops have been determined to have a moderate-to-high probability of containing sites; side hills and steep mountain slopes have a low probability of containing sites.

District and Forest records provide an understanding of the expected cultural resources within the Decision Area. Additionally, 56 cultural resource inventories have occurred within the Decision Area. A total of 27 sites eligible to the National Register of Historic Places were located. Information concerning the nature and location of cultural resources is confidential, and is not subject to public disclosure per Public Law 94-456 (16 U.S.C.470 sec. 9 (a) (1) (2)) in order to protect sites from vandalism, and to retain the confidentiality of sites culturally significant to American Indians.

ANALYSIS OF DIRECT AND INDIRECT EFFECTS

Alternative 2 – No Action Alternative

Alternative 2 would have no direct effect on cultural resources. No ground disturbing activities would take place, and cultural resources sites would remain in their current state. However,the increased risk of stand-replacing wildfire associated with this alternative could result in indirect effects. Wildfire may destroy or damage above-ground cultural resources. Burning tree roots or suppression efforts may expose and impact subsurface cultural resources.

EFFECTS COMMON TO ALL ACTION ALTERNATIVES

All Action Alternatives propose ground-disturbing activities and increased access to remote areas that have the potential to affect historic and prehistoric sites. Ground-disturbing activities could result in direct impact to the sites, while increased access can lead to vandalism, theft, and other indirect impacts. All areas proposed for ground-disturbing activities have been, or would be, inventoried prior to the implementation of any activity that has the potential to impact cultural resource sites.

Although management's intent is to identify all cultural resource sites, and avoid or mitigate prior to proposed ground-disturbing activities, there is the potential for unidentified sites to be located during project implementation. If this occurs, Timber Sale Contract Provision CT6.24 - Protection of Cultural Resources provides the Forest Service the opportunity to modify or cancel the contract to protect cultural resources, regardless of when identified. The discovery of any cultural resource sites during the implementation of the proposed project could result in implementation delays (USDA Forest Service 1987b Appendix 19).

The Forest Archaeologist will notify and consult with the State Historic Preservation Office, as required by law, to determine the significance of the discovery and the effects of the project. The Confederated Salish and Kootenai Tribes and the Kootenai Tribe of Idaho would be included in discussions where American Indian affiliated sites are involved.

The Cumulative Effects Worksheet, located in the Cultural Resource section of the Project File, contains the detailed analysis of all past, current, and reasonably foreseeable activities listed in Tables 3-1 and 3-2 (pp III-2 – 4). The activities listed below may have a measurable cumulative effect to the cultural resources.

Vegetation Management and Fuels Reduction Activities

The units associated with the Young Dodge Analysis Area will receive a cultural resource survey prior to project implementation. Project implementation will avoid sites whenever possible. If avoidance is not possible then sites will be protected, or mitigated. There will be no cumulative effects to cultural resources.

Livestock Grazing

Currently, there are no known effects to any sites occurring from cattle grazing.

Noxious Weed Treatment

Most noxious weed treatment is along roadways. This activity would have no ground disturbing activities, and would not involve the use of heavy equipment other than on existing road surfaces. There would be no effects to cultural resources.

Fire Suppression

Fire suppression and rehabilitation activities may affect cultural resource sites. An archeologist would be available to provide information regarding known sites. When avoidance during a wildland fire is not possible, management would follow measures outlined in the Region 1 Programmatic Agreement.

Road Activities

Road maintenance and use associated with permit administration, data collection, monitoring, and administration of NFS lands does not involve the use of heavy equipment other than on existing road surfaces. Based on the types and extent of these uses in the Decision Area, there would be no impacts to cultural resources.

Recreation Maintenance

Fee campgrounds, building construction, and new trail construction or reconstruction would require a cultural resource inventory prior to the implementation of the project. There would be no cumulative effects to cultural resources.

Special Uses

Outfitter/guides confined to known trails and road surfaces will have no cumulative effects to cultural resources.

Public Actions

Recreation activities occur off existing road surfaces and are small in scale. Based on the types and extent of these uses in the Decision Area, there will be no cumulative impacts to cultural resources.

Actions such as small forest product gathering (Christmas trees, boughs, mushrooms, and cones), other special uses, and firewood cutting will continue. These activities do not involve the use of heavy equipment other than on existing road surfaces. There would be no cumulative effects to cultural resources.

Private land

Development on private land has the potential to impact cultural resources. However, the Forest Service has no authority over private land use.

There may be effects to cultural resources from fire suppression activities, but these would not be in association with any Alternative. There would be no cumulative effects to cultural resources from vegetation management and fuel reduction activities, cattle grazing, noxious weed management, road management, recreation, special uses, public use, and private land, in association with the implementation of All Action Alternatives.

CONSISTENCY WITH REGULATORY FRAMEWORK

Forest Plan

The Forest Plan provides goals, objectives, and standards for cultural resource management in order to satisfy federal guidelines, laws, and Forest Service policy concerning cultural resource sites (USDA Forest Service 1987a II-2 5 25-26). The Forest Service Manual Chapter 2360 and the Code of Federal Regulations (36 CFR 800) provide directives to accomplish this. The Forest Plan requires integration of cultural resource management into the overall multiple resource management effort. In addition, the Forest must work closely with the appropriate scientific communities and American Indian tribes concerning this resource. To meet these objectives and standards, all areas would receive a cultural resource inventory prior to the implementation of any proposed project that has the potential to impact cultural resource sites. The Forest Plan provides direction to manage sites, whether discovered during the inventory or implementation of proposed activities. In addition, consultation, with the Confederated Salish and Kootenai Tribes, is ongoing to ensure their known interests. To date, the Tribe has not identified any concerns with the Action Alternatives. Therefore, All Action Alternatives would be consistent with Forest Plan direction.

To meet Forest Plan objectives and standards, all areas will be inventoried prior to the implementation of any proposed project that has the potential to impact cultural resource sites. All associated cultural sites would be recorded, and either avoided or mitigated.

Other Laws and Regulations

The laws concerning cultural resources include the Antiquities Act of 1906 and the National Historic Preservation Act (NHPA), as amended (16 USC 470-470t, 110). The Antiquities Act provides for the protection of historic or prehistoric remains, or any object of antiquity, on Federal lands. The NHPA is the Federal law governing the preservation of historic and archeological resources of national, regional, state, and local significance on all proposed ground disturbing activities. Section 106 of the NHPA requires that the head of a Federal agency having any jurisdiction over an undertaking, or authority to license any undertaking, shall take into account the effect of the undertaking on any site, district, building, structure, or object that is included in, or eligible to, the National Register of Historic Places. The standard review process is described in federal regulations issued by the Advisory Council on Historic Preservation. Entitled, "Protection of Historic Properties," the regulations appear in the U.S. Code of Federal Regulations at 36 CFR Part 800.

In addition, the laws and policies that govern cultural resource protection on Federal and State lands are coordinated with the State Historic Preservation Officer (SHPO) of Montana, who serves in an advisory capacity. The policies of the Forest Service and SHPO are consistent. The implementation of all alternatives would be in compliance with the appropriate cultural resource guidelines.

The Archaeological Resource Protection Act protects historic and prehistoric sites on public land and allows prosecution for relic collecting.

Public education on cultural resources will continue through lectures, interpretative projects, and brochures while keeping site specific information confidential as per Public Law 94-456, [16 U.S.C. 470 Sec. 9 (a) (1) (2)].

All alternatives would be consistent with laws and regulations pertaining to cultural resources.

AMERICAN INDIAN RIGHTS AND TRIBAL CONSULTATION

The Federal government has the responsibility to consult with Tribes under a government-to-government relationship. The Decision Area is located within lands encompassed by the Hellgate Treaty of 1855, signed between the United States and the Flathead Indians, Upper Pend d'Oreilles Indians, and the Kootenai Tribes and Kootenai Tribe of Idaho. Under the Hellgate Treaty, the Indians retained certain rights including fishing, hunting, gathering plants, erecting temporary buildings for the curing, and pasturing their horses and cattle. Ongoing consultation ensures consideration of Tribal rights. Thus far, the Confederated Salish and Kootenai Tribes and Kootenai Tribe of Idaho have expressed no concerns pertaining to proposed activities.

American Indian Tribes have special rights under the National Historic Preservation Act (NHPA), the Native American Graves Protection and Repatriation Act (NAGPRA), and the American Indian Religious Freedom Act (AIRFA). Federal guidelines direct federal agencies to consult with modern Native American Tribal Representatives who may have concerns about federal actions that may affect religious practices and other traditional cultural uses, as well as cultural resource sites and remains associated with American Indian heritage. Tribes, whose aboriginal territory falls within a project area, have the opportunity to voice concerns for issues governed by NHPA, NAGPRA, or AIRFA.

The American Indian Religious Freedom Act of 1978 protects the "inherent right of the freedom to believe, express, and exercise their traditional religions" (P.L. 95-442, 92 Stat. 1065; 7 U.S.C. 2269). The Forest has identified the Confederated Salish and Kootenai Tribes and Kootenai Tribe of Idaho as having general concerns about the management of the Decision Area. These concerns include, but are not limited to, access to sites, use and possession of sacred objects, and the freedom to practice sacred worship ceremonies. Based upon ongoing consultation, there are no areas known to be sensitive to the tribes within the Decision Area.

ENVIRONMENTAL JUSTICE

The alternatives were assessed to determine whether they would disproportionately impact minority or low income populations, in accordance with Executive Order 12898. No local minority or low-income populations were identified during scoping or effects assessment. No minority or low-income populations are expected to be impacted by implementation of the alternatives.

POTENTIAL CONFLICTS WITH PLANS AND POLICIES OF OTHER JURISDICTIONS

Cultural Resources

The laws and policies that govern cultural resource protection on Federal Lands are coordinated with the State Historic Preservation Officer (SHPO) of Montana, who serves in an advisory capacity. The policies for the Forest Service and SHPO are consistent: the Forest Service would inform and consult with the Confederated Salish and Kootenai Tribes and Kootenai Tribe of Idaho on proposed activities, site information, and potential impacts.

Wildlife

The Forest Service and Montana Fish, Wildlife, and Parks work together to manage wildlife, but the missions of the two agencies differ. The Forest Service manages its land resources to provide habitat (forage, snags, cover, security habitat, etc.). Montana Fish, Wildlife, and Parks manages the animal populations. They affect wildlife by adjusting hunting seasons and bag limits, and by enforcing other rules that affect the populations of fish and wildlife.

The Forest Service works with the US Fish and Wildlife Service for the recovery of Threatened and Endangered Species. The Forest Service consults with the US Fish and Wildlife Service when Threatened and Endangered Species may be affected.

Water Quality

Section 313 of the Clean Water Act requires Federal agencies to comply with all Federal, State, interstate, and local requirements, administrative authority, and process and sanctions with respect to the control and abatement of water pollution. Executive Order 12088 also requires the Forest Service to meet the requirements of the Act. All alternatives would comply with the Clean Water Act and Montana State Water Quality Standards. These alternatives would incorporate reasonable Soil and Water Conservation Practices, avoid channel degradation, and comply with the Forest Plan.

Air Quality

The prescribed burning proposed in Alternatives 1, 1M, and 3 has the potential to affect local air quality. This activity is conducted in accordance with the State of Montana air quality guidelines administered by the Montana/Idaho Airshed Group, which is made up of industry, State and Federal agencies, and local health department representatives.

Potential conflicts occasionally exist between the Forest Service's concerns for meeting land management goals and the commitments of the State agencies for clean air.

Other sources of potential conflict exist between private landowners, State land management agencies, and adjoining National Forests competing for the limited number of suitable burning days.

PROBABLE ENVIRONMENTAL EFFECTS THAT CANNOT BE AVOIDED

Implementation of any alternative may result in some adverse effects. The severity of effects can be minimized by adhering to the features of the alternatives, such as Best Management Practices and other design criteria. If management activities occur, however, some effects cannot be avoided. Even the No Action alternative has effects.

Cultural Resources

There is no assurance that every cultural resource site will be located in advance of all planned management activities. Some ground-disturbing activity may affect an undiscovered historic or prehistoric site. However, sites discovered in this manner would immediately be protected from further disturbance.

Scenic Resources

The introduction of timber harvest units would add a variety of line, form, color, and texture to the landscape. Forest users may see a modified forest in the foreground, middle-ground, and background where harvest and prescribed burning, is implemented.

Wildlife

During timber harvest and site-preparation activities, a variety of wildlife species would be displaced from the immediate area for the duration of the activities.

Species requiring old forest habitat would experience a short-term reduction in available and/or suitable habitat, if management activities occur in these areas. If no management action is taken, there is the potential for long-term loss of old forest habitat.

Prescribed burning in the spring may result in mortality to some species of nesting birds and small mammals.

Air Quality

Temporary seasonal effects on air quality are unavoidable under any of the **action alternatives**. Prescribed fire is an integral part of ecosystem management, fuel treatment, and site preparation for reforestation. These activities would be scheduled when air dispersion is good.

RELATIONSHIP BETWEEN SHORT-TERM USE AND LONG-TERM PRODUCTIVITY

Short-term uses are those that generally occur annually. Long-term productivity refers to the ability of the land to produce a continuous supply of a resource.

Soil Resources

Proposed activities would result in a decrease in long-term soil productivity for areas of detrimentally disturbed soils. These areas are quantified and described in the Soils section of this chapter.

Water Quality

Stream channel conditions are expected to be protected, and water quality is not expected to be impacted by proposed activities. Short-term effects would occur as described in the Water Resources section of this chapter. No impacts to long-term productivity are anticipated.

Wildlife

Key habitat requirements for wildlife species include feeding habitat or foraging areas interspersed with nesting or denning habitat and thermal and hiding cover. As the feeding habitats experience successional changes and reforestation, they would again provide cover. The appropriate scheduling of timber harvest can provide and sustain a mosaic of cover and feeding habitat.

Vegetation

Managed stands of timber produce a higher volume through time than unmanaged stands. Regeneration of desired, fast-growing species, planting of genetically-selected trees, stocking control to reduce competition and improve growth of individual trees, and intermediate treatments to maintain the health and vigor of stands are silvicultural means of maintaining the long-term yield of forest stands.

In the short-term, harvesting dead or dying stands of timber captures economic value that would otherwise be lost. Timely reforestation puts the land back into a productive timber-growing condition.

Air Quality

The temporary impacts of smoke from prescribed burning and road dust from vehicles associated with proposed activities would have minor, short-term effects on the scenic resource and recreation use. The short-term impacts are offset by minimizing the risks from wildfire. Short-term impacts from prescribed burning are required to decrease wildfire risks on some sites. Wildfires would contribute significantly more air pollution than prescribed fire activities.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

An irreversible commitment of resources refers to the loss of production or use of a resource due to a land use decision that, once executed, cannot be changed. An irretrievable commitment of resources applies to losses of production or use of renewable resources for a period of time.

Soil Productivity

Best Management Practices and Design Criteria would be used to avoid soil productivity losses from timber harvesting and associated road/skid trail construction.

Vegetation

Timber harvest would change plant succession, stand development, and species composition. Under Alternative 2 (No Action), the risk that a wildfire would escape initial attack and development into stand-replacing wildfire would increase, which could indirectly cause the loss of both old forest character and designated old growth. If this were to occur, it would constitute an irreversible commitment of resources.

Air Quality

The impact of prescribed burning and road dust from management activities would have temporary seasonal impacts on the air quality in Alternatives 1, 1M, and 3. Reduction of air quality would constitute a short-term irretrievable resource impact.

Scenic Resource

Irretrievable changes in the appearance of the landscape would occur under the action alternatives. These changes would become progressively less noticeable as vegetation recovers in harvested areas and along roads.

Wildlife

The loss or modification of habitat for certain wildlife species is an irretrievable commitment of resources. As vegetation recovers, this habitat would recover. However, the time frame for this to occur may be as long as several decades for cavity dependent, mature and old growth related species.

Cultural Resources

Any activity that would disturb a cultural resource is an irreversible commitment.

SPECIFICALLY REQUIRED DISCLOSURES

Administration of the Forest Development Transportation System

A roads analysis has been prepared for the Young Dodge Analysis Area in accordance with the Roads Policy (36 CFR Part 212 et al, as published in the Federal Register on January 12, 2001).

Effects of Alternatives on Social Groups

In accordance with Executive Order 12898, there would be no overall differences between the alternatives in terms of effects to minorities, American Indians, women, or the civil liberties of any American citizen.

Effects on Floodplains and Wetlands

Floodplain areas constitute all of the wetlands in the Analysis Area and are protected by RHCAs. Wetlands may occur in the form of seeps, springs, and small bogs and ponds within the Decision Area. These wetlands should not experience any significant adverse effects from management activities. The floodplains within the Decision Area would not receive measurable impacts from upstream influences. Management activities designed to protect these resources conform to the federal regulations for floodplains (Executive Order 11900) and wetlands (Executive Order 11990). Please refer to the Regulatory Framework section of the Water Resources Specialist Report in the Project File for detailed information on this subject.

Effects of Alternatives on Threatened and Endangered Species

Threatened and endangered wildlife, fish, and plant species may be affected by the proposed activities in the Decision Area. A biological assessment will be prepared and submitted to the U.S. Fish and Wildlife Service for concurrence according to the Endangered Species Act, to insure protection of these species.

Energy Requirements and Conservation Potential of Alternatives

The energy required to implement the alternatives, in terms of petroleum products, would be insignificant when viewed in the light of the production costs and effects of the national and worldwide petroleum reserves.

Effects of Alternatives on Prime Rangeland, Forest Land, and Farm Land

The alternatives presented are in compliance with Federal regulations for "prime land." The definition of prime forest land does not apply to lands within the National Forest System. The Decision Area contains no prime farm lands or rangelands. In all alternatives, Federal lands would be managed with the appropriate consideration to the effects on adjacent lands.

Migratory Bird Treaty Act

The action alternatives contain practices that avoid or minimize, to the extent practicable, adverse impacts on species of migratory birds. The action alternatives would increase patch sizes in the Decision Area, which would set the stage for larger patches of interior forest, which are utilized by a variety of migratory species, in the future. The action alternatives have the potential to cause direct mortality to ground-nesting or cavity-nesting species by damaging or removing nest sites or eggs or young prior to fledging during harvest activities, if these activities occur during the few months of the nesting season in the spring and early summer. Consequently, the action alternatives could affect individuals, but adverse effects to population viability would not be expected.

Interior Columbia Basin Project

In the fall of 1996, scientists associated with the Interior Columbia Basin Ecosystem Management Project released a summary of their integrated assessment of the ecological integrity and the socioeconomic resiliency of the Upper Columbia River Basin. Information from that assessment was considered in this document.

CHAPTER 4 - PUBLIC INVOLVEMENT AND RESPONSE TO PUBLIC COMMENT

INTRODUCTION

Chapter IV describes the public involvement activities for the Young Dodge Draft Supplemental Environmental Impact Statement (DSEIS), and provides the ID Team's Responses to Comments on the DSEIS. The following topics are presented:

- Public involvement activities prior to the release of the DSEIS
- Public involvement activities following the release of the DSEIS
- Issues raised during the public involvement process
- Comments and the Final Supplemental EIS
- Letters and Forest Service responses
- Responses to Public comments on the DSEIS

PUBLIC INVOLVEMENT ACTIVITIES PRIOR TO THE RELEASE OF THE DSEIS

The Rexford District began the planning effort for the Young Dodge project in March 2007. An open house was held for residents of the West Kootenai, a community located in the northeastern portion of the Project Area. The purpose of the open house was to give residents and others the opportunity to review the project proposal prior to scoping. Sixteen individuals attended. This was followed by an open house for the Kootenai Forest Stakeholders Coalition, and a subsequent meeting. Letters were sent to owners of private property within the Decision Area, asking for their participation in identifying opportunities for managing the natural resources on National Forest System land. On May 4, 2007, a scoping package was sent to individuals, organizations, American Indian tribes, federal and state agencies, and other interested parties requesting their comments, concerns, and issues regarding the Proposed Action. A letter summarizing the Proposed Action was mailed to all landowners in the West Kootenai. The letter noted the availability of the scoping package and information on how to obtain it. The scoping period was 30 days in length. There were eleven comment letters received in response to this scoping package.

Legal notices requesting comment on the Proposed Action were published in the *Tobacco Valley News* and the *Daily Inter Lake* (newspaper of record) on May 10, 2007 and May 11, 2007, respectively. The scoping package and legal notices provided notification that the Proposed Action would result in forest openings exceeding 40 acres, which would require Regional Forester approval. The scoping package also included information that the Proposed Action would require project-specific amendments to the Kootenai Forest Plan to exceed the open road density standard in Management Area 12 during harvest activities, for non-maintenance of movement corridors, and for harvesting new units when adjacent units would not provide hiding cover.

The Rexford District hosted an open house on May 16, 2007 attended six individuals along with members of the Young Dodge interdisciplinary team and the Rexford District Ranger.

Eleven letters and comment forms were received in response to the scoping package. The letters were reviewed to determine whether there were any Significant Issues. Refer to the Issue Development section of the Project File for additional information.

On July 20, 2007, a Notice of Intent to prepare an EIS to disclose the environmental effects of the activities associated with the Young Dodge project was published in the *Federal Register*.

On May 17, 2007, four people attended a field trip to the Decision Area. Three attendees are residents of the West Kootenai, one is a member of the Kootenai Stakeholders Group, and several members of the interdisciplinary team. A second field trip for the Kootenai Stakeholders Group was held on June 28, 2007. Six individuals from the Group attended, along with members of the interdisciplinary team.

In April, July, and October 2007 and January and April 2008, the Forest mailed the Schedule of Proposed Actions, which contained information on the Young Dodge project.

Coordination with the following State and Federal agencies occurred throughout the process. Contacts are documented in the Project File:

Montana Department of Environmental Quality
U.S. Environmental Protection Agency, Helena Office
Montana Fish, Wildlife and Parks
U.S. Fish and Wildlife Service
Natural Resources and Conservation Service, Bozeman
U.S. Forest Service, National Interagency Fuels Technology Team, Whitefish

Public Involvement Activities Following the Release of the Draft EIS

On February 5, 2008, the Young Dodge DEIS was mailed to individuals, organizations, American Indian tribes, federal and state agencies, and other interested parties for review and comment. Comments on the document were requested within 45 days of the publication of the Notice of Availability of the DEIS in the *Federal Register.*

Legal notices requesting comment on the DEIS were published in the *Tobacco Valley News* and the *Daily Inter Lake* (paper of record) February 7, 2008. The notices stated that the publication of the Notice of Availability of the DEIS would occur on February 15, 2008. Letters were mailed on February 26, 2008 announcing that the Notice of Availability of the DEIS was not published in the *Federal Register* until February 22, 2008.

Two individuals from the public attended an open house that was held at the Rexford Ranger District on March 17, 2008. An open house was held at the West Kootenai Store on March 20, 2008; fifteen individuals signed in.

This Final EIS (FEIS) and the Record of Decision (ROD) for the Young Dodge project will be mailed to individuals, organizations, American Indian tribes, federal and state agencies, and other interested parties. Notification of the availability of the FEIS will be published in the *Federal Register.* Public notification of the availability of the ROD and the 45-day appeal period will occur with legal notices to be published in the *Daily Inter Lake* and the *Tobacco Valley News.*

Issues Raised During the Public Involvement Process

Comments submitted in response to the scoping package received careful consideration by the interdisciplinary team and the Responsible Official. The Significant Issues identified through scoping were described and analyzed in the DEIS.

Comments and the Final EIS

The public comments received on the DEIS, as well as discussions during the field trips to the Decision Area, did not disclose any new Significant Issues or a need for substantial analysis. The Responsible Official chose the Preferred Alternative from the DEIS as the Selected Action in the ROD. There was one minor modification to Unit 2 in the Selected Action. This modification was to change the northern finger of Unit 2 to a seed tree harvest. This seed tree harvest is designated as Unit 201. This change increased the crown removal in the 15 acres in Unit 201. Because of this, the remaining 147 acres in Unit 2 would leave more trees than originally planned to balance the overall crown removal over the 162 acres.

This modification is minor and would not change the findings in the DEIS.

Response to comments from the Final Environmental Impact Statement can be found in the Project File.

Appeal and Draft Supplemental EIS

The Young Dodge Project was appealed and remanded for further analysis. On April 2, 2010, the Rexford Ranger District published the Intent to Prepare a supplemental environmental impact statement in the *Federal Register*.

Information about the Young Dodge Project was included in the Schedule of Proposed Actions mailed by the Forest in January of 2011.

The Notice of Availability for the Draft Supplemental EIS was published in the *Federal Register* on 6/18/2010. Legal notices announcing the availability of the DSEIS and requesting comment on the DSEIS were placed in the *Daily Interlake* (6/18/2010) and *Tobacco Valley News* (6/17/2010). Copies of the Draft Supplemental EIS were mailed to individuals, organizations, American Indian tribes, federal and state agencies, and other interested parties for review and comment on June 16, 2010.

This Final Supplemental EIS (FSEIS) and the Record of Decision (ROD) for the Young Dodge project will be mailed to individuals, organizations, American Indian tribes, federal and state agencies, and other interested parties. Notification of the availability of the FSEIS will be published in the *Federal Register*. Public notification of the availability of the ROD and the 45-day appeal period will occur with legal notices to be published in the *Daily Inter Lake* and the *Tobacco Valley News*.

Issues Raised During the Public Involvement Process

Comments submitted in response to the scoping package received careful consideration by the interdisciplinary team and the Responsible Official.

Comments and the Final Supplemental EIS

The public comments received on the DSEIS, as well as discussions during the field trips to the Decision Area, did not disclose any new Significant Issues or a need for substantial changes in analysis.

Letters and Forest Service Responses

Each comment received was valuable; opinions, feelings, suggestions, and observations were all carefully read and considered by the members of the interdisciplinary team, the District Ranger, and the Responsible Official (Forest Supervisor). Each comment was weighed on its own merits against legal, technical, and resource capability considerations.

The letters received in response to the DSEIS, along with the Forest Service response to those comments, begin on the following page.

Letter #	Author
1	Lincoln County Commissioners
2	Environmental Protection Agency
3	The Lands Council/Alliance for the Wild Rockies
4	The Department of Interior

Letter 1. Lincoln County Commissioners

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BOARD OF COUNTY COMMISSIONERS
LINCOLN COUNTY
STATE OF MONTANA
ANTHONY J. BERGET, Commissioner DISTRICT NO. 1, LIBBY
JOHN C. KONZEN, Commissioner DISTRICT NO. 2, TROY
MARIANNE B. ROOSE, Commissioner DISTRICT NO. 3, EUREKA
TAMMY D. LAUER CLERK OF THE BOARD AND COUNTY RECORDER

Betty Holder
Rexford District Ranger
Eureka Ranger Station
949 HW 93N
Eureka, MT 59917

E-mail: comments-northern-kootenai-rexford@fs.fed.us

Re: Young Dodge DSEIS

Dear Ranger Holder:

Thank you for the opportunity to comment, once again, on the ongoing saga of Young-Dodge.

Your detailed evaluation in the current DSEIS of the question over the potential effects of this project on goshawks should put that issue to rest, as it clearly shows no significant impact on the species, its overall potential habitat long-term, nor a contribution toward loss of species viability.
We continue to concur with your purpose and need for action, and see this proposal as part of a necessary movement toward active management that can better provide for the overall health of the forest and at the same time better provide for economic and recreational needs for the surrounding communities. Though we previously endorsed Alternative 1, we now favor Alternative 1-M. Though Alternative 1-M treats somewhat fewer acres, it incorporates new information gathered on the ground and includes, notably, some mosaic and "free selection" units that could further research in how these methods might be adapted into this forest type. It also incorporates additional constructive comments and suggested changes emanating from field trips and discussions with the Kootenai Forest Stakeholders Coalition and we appreciate and support your efforts in cooperating with this group of diverse interests.

Our earlier comments remain essentially unchanged. We are pleased that the proposal not only recognizes and furthers the Lincoln County Fire Plan goal of treatment within the WUI to enhance the safety of nearby communities and private property, but also includes significant treatment of other areas outside the WUI but upwind of the West Kootenai community. The fire regime maps indicate that most of the area is included in Class 1 or 2; this, and a cursory look at the fuel loading in much of the area begs for an intense wildfire that would not respect WUI boundaries.

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<td>#1

#2</td>
<td>Your comment will be taken into consideration.

Thank you for your support.</td>
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This proposal also is to be encouraged for its capacity to help provide some satisfaction to the goal of providing a sustained yield of timber and other outputs at a level that helps support the economic structure of our local communities. This goal has seemingly taken a back seat to other pressures for too long. The economic benefits associated with the numerous activities incorporated in, and emanating from, this proposal are indeed of significant importance to us.	#3	Thank you for your support.
The proposal for improved access to Lake Koocanusa, and associated amenities (boat ramp, parking area, restroom) are heartily endorsed, though the caveat of "time and funding" creates some concern. The entire Libby Dam project, in its planning era, hinged on promises to create a recreational mecca in Lincoln County based on developed accesses to this huge reservoir. These promises fell short, particularly on the west shore.	#4	Thank you for your support. Your comment will be taken into consideration.
Hopefully, Betty, activities associated with this proposal in combination with other like-minded proposals across the forest can produce inroads to a forest health problem due in part to not just natural occurrence patterns, but also to a lack of active management. We continue to envision a National Forest that will, once again, generate the level of activity and revenue sufficient to provide our taxpayers compensation for the loss of these lands to the local tax base. Sincerely, John Konzen John C. Konzen, Chairman Marianne B. Roose Marianne B. Roose, Member Anthony J. Berget Anthony J. Berget, Member		

Letter 2 Environmental Protection Agency

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8, MONTANA OFFICE
FEDERAL BUILDING, 10 West 15th St, Suite 3200
HELENA, MONTANA 59626

EPA
7-30-10

Ref: 8MO

July 27, 2010

Mr. Glen McNitt, District Ranger
Eureka Ranger Station
949 U.S. Highway 93 N
Eureka, Montana 59917

Re: CEQ # 20100217, EPA Comments on Draft Supplement EIS for Young Dodge Project

Dear Mr. McNitt:

The Environmental Protection Agency (EPA) Region VIII Montana Office has reviewed the Draft Supplemental Environmental Impact Statement (DSEIS) for the Kootenai National Forest's Young Dodge Project in accordance with EPA responsibilities under the National Environmental Policy Act (NEPA), 42 U.S.C. 4231 and Section 309 of the Clean Air Act.

The DSEIS identifies Alternative 1 Modified as the preferred alternative on Map 2-2, and this modified preferred alternative includes changes to treatment prescriptions in Units 12, 17, 21, 25, 29, 38, (primarily changing from seedtree to shelterwood harvests), and elimination of Unit 129 along with some minor boundary and acreage changes on some units. Total harvest acreage would be reduced by 435 acres, and harvest volume would be reduced by 3,508 CCF by the modification in the preferred alternative (i.e., from 19,502 CCF timber harvested on 2,927 acres in Alternative 1 to 15,994 CCF timber harvested on 2,492 acres in Alternative 1 Modified).

EPA supports the modifications in the preferred alternative since they will likely reduce erosion potential and soil disturbances from proposed timber harvests, although we still have concerns that the majority of timber harvesting is proposed to be carried out via more disturbing ground skidding methods that have greater potential for erosion and sediment production. Table 2-4 shows 3,891 acres of ground skidding vs. only 104 acres of skyline harvest and 104 acres of adverse forwarder harvest with Alternative 1 Modified. This includes harvests on units 12, 21, 212, 220 which already appear to be near the Regional Standard of 15 percent detrimental soil disturbance. We continue to believe that additional use of logging methods with less ground disturbance would be appropriate for logging units that are already near the Region Standard for cumulative detrimental soil disturbance levels.

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#1

Response to #1: Because many of these units are at lower elevations that rarely have good winter harvest conditions; they were not required for winter harvest. However winter harvest is not ruled out for any of these units if optimal winter conditions are present. The DSEIS instead required the following design criteria to ensure that Regional Soil Standards are met (Page II-37):

- Operate equipment over slash mat where feasible.
- Utilize existing skid trials and landings in all units where they exist and where feasible; specifically in Units 2, 12, 15, 19, 21, 47, 54, 112, 211, 212, and 220.
- Skid Trails within units 2, 12, 15, 21, 112, 211, 212, and 220 will be ripped and/or recontoured and covered with slash and coarse woody debris.

The numbers shown in Table 3-5 of the DSEIS (Pages III-16 and 17) show what is expected from adding the expected disturbance to the existing disturbance without considering overlap. In reality there is overlap of disturbance, especially when following the design criteria above. Of the units monitored on the Rexford and Fortine Districts, the added disturbance has been less than 8 percent on units with previous disturbance (refer to Soil and Water Project File document 'North End Post-Activity Soil Disturbance Monitoring'). Therefore, it is expected that cumulative disturbance post-harvest would be less than that displayed in the DSEIS.

We also note that 456 acres of mechanical piling is proposed on sensitive soils with Alternative 1 Modified (Table 3-4, page III-15). Landtypes 101, 252, 357, and 407 are stated to have "severe" sediment hazard with regard to timber management. From evaluation of Map 3-2 (Young Dodge Analysis Area Landtypes) and Map 2-2 showing harvest units in Alternative 1 Modified it appears that units 38, 40, and 138 may be located on landtype 357 that is identified as having a severe sediment hazard for timber management. We recommend that the FEIS discuss erosion potential for timber harvest units proposed on severe sediment hazard landtypes. We generally recommend avoidance of timber harvests on landtypes with severe erosion hazards, and encourage use of less ground disturbing logging methods as much as possible on erosive soils (e.g., skyline logging, helicopter logging, logging during winter on snow or frozen ground, etc.).	#2	Response to Comment #2: The 456 acres of mechanical piling on sensitive soils identified in Table 3-4, Page III-14 and 15 of the DSEIS, were all identified as low productivity soils. In the Planning Area , low productivity landtypes include 303, 405, and 406 (DSEIS Page III-12). All of these landtypes have areas of rock outcrops, ridges, and shallow soils over bedrock. These areas or inclusions in larger fuels reduction units may not have enough fuel to be piled and thus would only be underburned. As stated on Page II-10 of the DSEIS, "Piling would occur in portions of some units where fuel loads would cause high levels of mortality in the residual stand." If all the areas identified for piling would be piled, it would add up to less than one percent of the planning area (DSEIS, Soils Table 3-4, Page III-14 and 15). Monitoring results show two percent disturbance for excavator piling (DSEIS, Soils Table 3-1, Page III-6). Therefore, there would be less than 2/100s of 1 percent of the Analysis Area that would be affected if piling occurred on the landtypes in question. Harvest Units 38, 40, and 138 are on landtypes 322, 352, and 382; not on landtype 357 as referred to in the comment. There are no timber harvest units on sensitive soils (DSEIS, Page III-12).
In addition, we remain concerned that the modified preferred alternative does not include closure of segments of Roads #303 and #7168 to allow open road density standards for MA 12 to be met. We support closure of 1.19 miles of Road #303 and 0.17 miles of Road #7168, both of which are currently open yearlong, which had been proposed in Alternative 3 to meet the MA 12 open road density standard of 0.75 mi/mi2 during project implementation and over the long-term. Such road closures would reduce fragmentation of wildlife habitat and risks to wildlife security.	#3	Response to Comment #3: The MA 12 open road density standard is proposed to be exceeded because of historic high use of these roads. A programmatic Forest Plan amendment was granted for this proposed exceedance for the Young Dodge planning area.
We do want to indicate that EPA supports reduction of hazardous fuels and fire risk in wildland urban interface (WUI) areas near homes and structures where there is high fire risk, and restoration of declining tree species such as Ponderosa pine and western larch. We also support the proposed decommissioning of 12.25 miles of existing road and placement of 27 miles of roads in long-term storage, and maintenance on portions of 98 miles of roads in order to reduce road impacts to soil and water resources. EPA fully supports road BMP and drainage improvements, and road decommissioning and reductions in road density, since these are critical to protecting aquatic health. Reductions in road density, especially road stream crossing density, are often correlated with improved aquatic health, as well as improved wildlife habitat and security. We are also pleased that the proposed project includes no new road construction, although 0.4 miles of road will be reconstructed, and 8.85 miles of existing unauthorized road will be added to the National Forest Road System.	#4	Response to Comment #4: Thank you for your support in these areas.
Based on the procedures EPA uses to evaluate the adequacy of the information and the potential environmental impacts of the proposed action and alternatives in an EIS, the Draft Supplemental EIS for the Young Dodge Project has been rated as Category EC-2 (Environmental Concerns - Insufficient Information). EPA's concerns regard potential erosion and sediment transport to surface waters during ground skidding timber harvests. A copy of EPA's rating criteria is attached.	#5	Response to Comment #5: Please see response to comments #1 and #2.
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We appreciate the opportunity to participate in the NEPA process and provide comments on the DSEIS. If you have any questions please contact Mr. Steve Potts of my staff in Helena at 406-457-5022 or in Missoula at 406-329-3313 or via e-mail at potts.stephen@epa.gov. Thank you for your consideration.

Sincerely,

Julie A. DalSoglio

Julie A. DalSoglio
Director
Montana Office

cc: Larry Svoboda/Connie Collins, EPA 8EPR-N, Denver
Robert Ray/Mark Kelley, MDEQ, Helena

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U.S. Environmental Protection Agency Rating System for Draft Environmental Impact Statements

Definitions and Follow-Up Action*

Environmental Impact of the Action

LO - - Lack of Objections: The Environmental Protection Agency (EPA) review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

EC - - Environmental Concerns: The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce these impacts.

EO - - Environmental Objections: The EPA review has identified significant environmental impacts that should be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no-action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

EU - - Environmentally Unsatisfactory: The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potential unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the Council on Environmental Quality (CEQ).

Adequacy of the Impact Statement

Category 1 - - Adequate: EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis of data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

Category 2 - - Insufficient Information: The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses or discussion should be included in the final EIS.

Category 3 - - Inadequate: EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the National Environmental Policy Act and or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

* From EPA Manual 1640 Policy and Procedures for the Review of Federal Actions Impacting the Environment. February, 1987.

Letter 3 The Lands Council and Alliance for the Wild Rockies

July 29, 2010

Glenn McNitt, District Ranger
Rexford Ranger District
1299 Highway 93 North
Eureka, Montana 59917

Transmitted via email–please acknowledge receipt!

Mr. McNitt:

These are comments on the Young-Dodge Draft Supplemental Environmental Impact Statement (DSEIS), on behalf of The Lands Council and Alliance for the Wild Rockies.

First, we want to know the status of our previous comments and appeal, in terms of inclusion in the Young-Dodge Project Files.

1. Is our administrative appeal included in the Project Files?
2. Are our previous comments—both during scoping and on the original DEIS—included in the Project Files?
3. Are the **Appeal Attachments** and **the documents listed in the Literature Cited section of the administrative appeal** (sent on a data CD to the Regional Forester's office when the appeal was transmitted) now included in the Project Files?

These are pertinent questions because it seems to be the usual practice for the Forest Service (FS) at a DSEIS stage to fail to address issues previously raised by the public—especially those raised in appeals. In order to emphasize that we want the FS to directly address previous comments and appeal issues thus far avoided that situation, the following in blue text are appeal issues we believe are still quite relevant, as comments on the DSEIS.

I. SUMMARY

Google Earth image of Young Dodge Project Area.

Please note that Betty Holder is now the District Ranger of the Rexford Ranger District. Also, due to address updates for the emergency response system, the new mailing address for the district office is:
949 Highway 93 North
Eureka, MT 59917.

All appeal documentation will be included in the Project File, as will your previous comments.

The project would be illegal and otherwise represents unwise management for the various reasons discussed in appellants' comment letters on the DEIS. In particular, the reasons are that the DSEIS fails to adequately analyze and disclose cumulative effects of logging, fire suppression, and other management activities on various important "Ecological Factors." These ecological factors include:

- Amount, distribution, and size of intact and effective old-growth and mature forests;
- Population sizes and distribution of management indicator, Sensitive, Threatened, and Endangered wildlife species and their habitats;
- Amount and size distribution of snags;
- Amount and distribution of down logs;
- Land and soil productivity reductions or losses throughout the project area;
- Native fish populations and habitat components;
- Distribution of fuel conditions and therefore potential fire behavior.

#1

Response to Comment #1: Cumulative effects analysis of all management activities is included in the FSEIS under each of the mentioned resources, as well as more detailed analyses in the Cumulative Effects worksheets included in the Project File. Analysis of old growth forests, population of sensitive, threatened, and endangered species, and snags can be found in the Wildlife Section of the FSEIS. Coarse woody debris and soil productivity is discussed in the Soils Section. Native fish populations are analyzed in the Fisheries Section and fuels and fire behavior are analyzed in the Fuels Section of the FSEIS.

Because Appellants' comments on the DEIS were so highly detailed, and because the Forest Service (FS) responses were either non-responsive or otherwise failed to adequately address the issues, there is no need to repeat the same text here. Those letters clearly speak for themselves, and the FS responses speak for the agency's unwillingness to address public concerns. We do, however, fully incorporate our comment letters on the DEIS within this comment on the DSEIS.

#2

Response to Comment #2: Refer to document "Response to Scoping Comments" in the Project File (Volume 1, Document 079) to gain an understanding of how these comments were addressed.

We elaborate on some of those issues, below.

II. NARROWLY FOCUSED "REFERENCE CONDITIONS", VEGETATIVE CONDITIONS, AND CONTORTIONS OF SCIENCE.

2

As discussed in The Lands Council's DEIS comments, the reasons given for the proposed logging is to address alleged vegetation imbalance regarding only tree species, tree densities including "fuels", and forest patch sizes—the project area being out of its "reference condition." However, there is insufficient scientific basis for the DSEIS's reasons.

First, TLC's DEIS comments included, "Arno et al., 1997 make no such claims as to larch reference conditions being 'open and park-like.'" In responding to comments, the FS still maintains that Arno et al., 1997 supports the Young Dodge purpose and need. But a closer examination of Arno et al., 1997 merely confirms Appellants assertion. Arno et al., 1997 was a continuation of a previous Arno study, and all together researchers only could find **three** old growth **larch** stands that had evidence of frequent fire a la "open, park-like" **that had never been logged.** This is not a statistically sound representative sample, and surely doesn't prove anything about the larch stands in the Young-Dodge project area.

Some quotes from that study:

> "Our eleven sample stands include eight locations (fig. 1). One location was sampled with three plots and another with two plots to compare spatial variation (Arno and others 1995). Collectively these eight locations represent a range of contrasting conditions among western Montana pine and larch forests having had a history of frequent fire (table 1). **Certainly additional situations existed in natural stands.** For instance, we were unable to locate any relatively low-elevation dry-site ponderosa pine old growth that had experienced no logging and could therefore represent short fire intervals (5 to 15 years) on a dry site. We did, however, sample on short-fire-interval ponderosa pine stand on a moist site (plot B-4) as well as a larch stand on a very moist site (plot L-5) that had relatively short fire intervals (table 1). **Because these forest types have been logged, often repeatedly, for more than 100 years it was not possible to locate large unlogged stands and select sample areas using criteria that would ensure representativeness** (Arno and others 1995). Our samples represent all of the remnant stands on both dry and moist sites that we were able to locate with a moderate amount of search and inquiry."

(Emphasis added.) Site L-5 is the Girard Grove, well-documented traditional Indian gathering site:

> Similarly, the historical fire regime at stand L-5 may have had an important component of Indian burning for hundreds of years. …Girard Grove, the site of stand L-5, is at the outlet of Seeley Lake and is evidently at the end of the "Jocko Trail." Girard Grove could be assumed to be a likely camping area for native peoples. Numerous artifacts suggest a sustained level of aboriginal activity in areas immediately surrounding Girard Grove and dating back 3,500 years (Milo McLeod, personal communication).

That leaves two stands, one of which isn't even discussed in Arno et al, 1997.[1]

Secondly, Vegetative Response Units (VRUs) are not adequate drivers for massive logging:

> This analysis identifies specific disturbance processes, together with landform and other environmental elements, which have influenced the patterns of vegetation

[1] That stand was only discussed in the preceding Arno et al, 1995 which isn't even cited in the EIS.

3

#3

Response to Comment #3: A detailed explanation of how and why some areas in the Decision Area deviate vegetatively from "reference conditions" is given on FSEIS pages III-30-33. The conclusions drawn from the *Analysis of the Management Situation for the Revision of the Kootenai and Idaho Panhandle Forest Plans-Technical Report.* (USDA Forest Service 2003a) support the analysis presented.

#4

Response to Comment #4: Arno et al., 1997 on page 17 state "The historical interaction of frequent fire with ponderosa pine and larch in our 11 old growth stands helped produce a variety of age-class structures, although most stands probably had a similar physical (open, park-like) appearance".

#5

Response to Comment #5: Arno et al. 1997 also indicate that only two of the sample stands, L-5 and B-4, had archeological evidence of aboriginal use.

Arno et al. 1997 in their "Implications for Stand Management" discussion on page 19 state " Regardless of the ignition source, however, the frequent low-intensity fires produced an open stand of very large and long-lived larch represented by many different age-classes"

across the Decision Area. Vegetative Response Units (VRUs) were used to define and describe the components of ecosystems. VRUs are used to describe an aggregation of land having similar capabilities and potentials for management. These ecological units have similar properties in natural communities: soils, hydrologic function, landform and topography, lithology, climate, air quality, and natural processes (nutrient and biomass cycling, succession, productivity, and fire regimes). In addition to VRUs, this analysis divides the vegetation by Forest Type. Each Forest Type has a characteristic frequency and type of disturbance based on its climate, soils, vegetation, animals and other factors (Oliver and Larson 1999). Populations of native plants and animals have responded and adapted to these characteristic disturbance regimes and the resulting vegetation patterns and structure. These characteristic processes, patterns and structure are termed "Reference Conditions." (DEIS at III-17.) The reference condition is the range of conditions that would be expected to occur in a particular forest type when ecological processes are functioning properly. They are expressed as a range because of the dynamic nature of ecological systems. Reference conditions are assumed to be ecologically sustainable. (DEIS at I-1.) These desired conditions derive from Gautreaux (1999), a report that outlines VRUs and associated appropriate management strategies for the KNF, since on page I-1 the DEIS states: The **desired future condition** considered ecological processes.... Included in this determination was the identification of opportunities for moving resources toward their desired future conditions, as identified in the *Kootenai National Forest Plan* (1987a) and other documents, including ...*Kootenai National Forest Vegetation Response Units Characterizations and Target Landscape Prescriptions* (Gautreaux 1999) There is no verification in Gautreaux (1999), nor elsewhere in the Young Dodge DSEIS that VRUs actually correlate strongly with disturbance regimes or the target goals for vegetative structure and composition that the KNF states for each VRU. This is particularly troubling concerning the recent findings of Hessburg et al. (2007) who provide one of the only existing reviews of fire regime and vegetation correlation with potential vegetation types. Studying forest types in eastern Washington similar, but a bit drier on average, to those found in the Young Dodge project area that were likewise dominated by mixed and low severity fire regimes, Hessburg et al. (2007) found that "the potential vegetation type poorly explained this relation (i.e. fire severity) in mixed conifer forests in eastern Washington." In fact they found that "(p)otential vegetation types did not differ by fire severity class area with two exceptions...." For both one subregion and for the entire study area the exception they discovered was that area burned by high severity fires was approximately one third to two fold greater in the dry than moist forest types. They conclude: There has been a strong tendency to use the potential vegetation type as a surrogate for the vector of unknown environmental variables that controls fire severity. This was probably done for at least two reasons: (1) it is intuitive that the potential vegetation type might integrate and reflect the biophysical factors responsible for bottom-up spatial controls; and (2) foresters and fire scientists interested in 4	#6	Response to Comment #6: Gautreaux 1999 compiles the best available science concerning disturbance regimes and reference conditions of the forest types on the Kootenai National Forest . This science includes the 1996 General Technical Report PNW-GTR-282 "Integrated Scientific Assessment for Ecosystem Management in the Interior Columbia River Basin. Other studies compiled in Gautreaux 1999 can be found on pages 155-158 of that document.

> landscape restoration need a method to spatially distribute historical and present-day fire disturbance and its effects in order to simulate spatio-temporal patterns and variation in forest structure and composition. These reasons aside, we suspect that any vector of purely environmental variables will fall short as a useful surrogate for fire severity because such patterns are inherently noisy and influenced by processes with strong stochastic elements.

#7 Thus, in the absence of verification of the validity of VRUs as a predictor of historical vegetation patterns and fire regimes for the project area and given the total lack of site specific data documenting the KNF's assumption that VRUs, fire regimes and their target vegetation goals are closely correlated, the KNF's use of VRUs to define reference conditions and justify intense, landscape level vegetation manipulation through commercial logging is untenable and represents a violation of NEPA and the APA.

#8 Even were the VRU's strongly predictive of historical vegetation patterns and disturbance regimes, the DSEIS does not make clear connections between the reference conditions assumed to be associated with a given VRU, its current vegetation and the necessity, utility, and appropriateness of the proposed treatments. For each VRU, the DSEIS cites some justification for commercial logging to "restore" some component of vegetation structure, species composition, or fuel arrangement, clearly placing the commercial logging "horse" before the restoration "cart." In the case of each VRU, the KNF asserts that fire suppression has created an abundance of mid successional mixed conifer forest are responsible for the degradation of ecosystem characteristics and function within the project area that must be restored.

#9 This worldview is glaringly ignorant of, or intentionally blind to, two critical points. First, while fire suppression is cited as the major cause of departures in the warm/dry, and to a lesser extent in the warm/moist VRU groups, the KNF's own analysis does not generally support this claim. It is important to premise the following discussion by acknowledging that the KNF **presents no actual data** of reference stand structures and composition compared to current vegetation structure and composition that demonstrates the changes the DSEIS purports has occurred due to fire exclusion. The KNF's claim that restoration is needed due to the degrading effects of fire suppression is based on its suspect VRU analysis and the desired conditions put forth therein. However, even within the VRU analysis itself there is significant evidence that fire exclusion has not caused widespread changes commensurate with the logging treatments proposed by the KNF. For VRU 2 which is the driest of the VRUs with significant representation in the project area, Gautreaux (1999), states:

> Low to moderate severity fires on a frequency of 15-45 years were the predominant disturbance, in the drier habitat types, playing a major role in maintaining the seral community of conifers. Nonlethal, nonuniform underburns were the most common type, typically on low elevations and on southerly aspects.... Mixed lethal, mosaic fires typically occurred at mid to upper elevations and northerly aspects, creeping along the surface and occasionally flaring up, killing trees in patches and aiding the creation of multiple age classes.... In a third scenario, high severity fires occurred much less frequently on an average of every 225 years but ranged from approximately 150-400+ years.

5

Response to Comment #7: Within the FSEIS, the Purpose and Needs A,B and C on Pages I-4 through I-7, Strategies 1,2, and 3 outlined on Page I-10, the vegetative management descriptions on pages II-4 through II-9 and the Analysis of Direct and Indirect Effect on pages III-38through III-40all make a clear connection between the reference conditions associated with a given VRU, its current vegetation and the necessity, utility, and appropriateness of the proposed treatments.

Response to Comment #8: In the project file (Vol6_D003_diagnosis) a tabular diagnosis compares the existing site-specific condition of proposed units against the desired condition for those units. The Diagnosis outlines the generalized prescription needed to put the subject unit on a trajectory that would attain the desired condition.

Also in the project file (Vol6_D004 through Vol6_D004zh) are notes for each unit comparing the existing condition with the desired condition. Based on this comparison, these notes outline treatment recommendations that would put that unit on a trajectory towards the desired condition. A CD with these notes was given to The Lands Council during a Kootenai NF stakeholders meeting.

Response to Comment #9: A thorough discussion of reference and existing stand structures and the role fire exclusion played in developing the existing condition is presented on pages III-30 through III-33 of the FSEIS. In some of the mid and upper elevation VRU's fire exclusion may not have played as large a role as in the lower elevations (Page III-80FSEIS). These areas still may pose a serious risk of wildfire. Page III-82 of the FSEIS states "However, some areas are at the upper end of the fire frequency range for both mixed severity and stand replacing fires. ... Most fires that escape initial attack will likely become stand-replacing fires. These are major events that can consume thousands of acres."

Comment	#	Response
This information is corroborated and displayed in the "Summary of VRU Attributes" on p. 6-7 of Gautreaux (1999), where mixed severity and "nonuniform lethal stand replacement" fires occurred on an average fire rotation interval of 225 in even the driest VRU (i.e. VRU 2) that occurs with any prevalence in the project area. Baker et al. (2006) note the importance of the mixed severity model in Rocky Mountain ponderosa pine/Douglas-fir forests: The data available to address the applicability of the variable-severity and low-severity models include about 80 observations from 16 forest reserve reports, supplementary historical analyses, 10 fire scar/age structure studies, and 20 direct measurements or reconstructions of tree density near ad 1900. Based on these data together, the variable-severity model, which emphasizes an important role for severe fires in the historical fire regime, appears to apply to a larger portion of the ponderosa pine–Douglas fir zone in the Rocky Mountains than does the low-severity model. In most Rocky Mountain ponderosa pine–Douglas fir forests, the variable-severity model, in which forest structures were shaped mainly by infrequent severe fires, is consistent with the evidence of fire history and tree age structures in these forests. Only limited areas of ponderosa pine–Douglas fir forests in the Rocky Mountains, primarily at low elevations and on xeric sites, appear to have been shaped primarily by low-severity fires. To assess which model may best fit a potential management area, site-specific information on fire history and forest conditions is required. Baker et al., 2006 recommend: For the purpose of ecological restoration in Rocky Mountain ponderosa pine–Douglas fir landscapes, the most appropriate action at the present time is a mixture of modest passive and active approaches. Undisturbed mature forests require little or no restoration – a passive approach is best. Active approaches may include a little thinning of young stands to enhance structures typical of later stages of development, combined with protection of old trees, reversal of adverse effects of logging and livestock grazing, and changes in land uses so they do not continue to cause degradation. Reintroduction of both low-severity surface fires and high-severity fires may be feasible under some circumstances of land use. However, reintroduction of fire should not be based on converting dense mature stands into sparse open woodlands based on the false premise that surface fires previously maintained tree populations at low densities. Thinning these forests is likely to lead to renewed tree regeneration, hence a need for renewed thinning, in a potentially endless, costly and futile cycle that does not restore the forest. Large, dead wood in most of these forests does not need reduction; certainly, raking, piling and burning large, dead wood is misdirected as these fuels may be ancient and are more likely to be in deficit than in surplus. A modest suite of reversal-reform approaches will provide benefits for both people and the ecosystem, and can begin today, even without needed research at the landscape scale. Ponderosa pine–Douglas fir forests in the Rocky Mountains, where the variable-severity model applies, are not in seriously degraded condition, compared to forests in which the low-severity model applies, and do not require much costly thinning and other active restoration actions. The variable-severity model, which applies to most of these forests, suggests that Rocky Mountain ponderosa pine–Douglas fir landscapes historically 6	#10	Response to Comment #10: We agree with Baker that some lower elevation sites did experience mixed-severity and stand-replacing events, especially on cooler, moister aspects (north and east). This is reflected in the discussions in Chapter III FSEIS page III-30-31.

> were dense, have long been naturally fire-prone, are dangerous places to live, and will remain so after restoration.

The DSEIS is filled with statements of the substantial changes that have occurred due to fire suppression such as the prevalence of mid successional stands, overcrowded and dense stands, a lack of seral species such as larch and ponderosa pine, and a susceptibility to insects and disease. Again it is important to note that the KNF presents no actual data as evidence of these claims but bases these assessments on the conditions expected based on their VRU analysis. However, the DSEIS does not explain how, even for the driest VRU group which historically have experienced fire free intervals of 45 years for low severity fires and much longer periods for more severe fires and is thus presumably most susceptible to the effects of fire suppression, forest structure and composition so far out of the historical range of variation that intensive and commercial logging is required to restore them. For instance, Keeling et al. (2006) quantified forest structure and composition of ponderosa pine/Douglas-fir forests of central Idaho and western Montana that had not experienced fire for 70+ years compared to paired, reference sites which had experienced 1-4 fires in the 20th century. In agreement with many other studies of fire excluded forests that were historically characterized by frequent fires, they found density increases and a trend towards more shade tolerant species. However, they highlight a point that the DSEIS fails to disclose or acknowledge, which calls into question whether, without some form of evidence, citing fire suppression actually justifies the specific commercial logging operation proposed in the Young Dodge project. Keeling et al. (2006) note that even 70+ years of fire exclusion do not produce consistent, predictable or generally severe departures from reference conditions. They state:

> Our results confirm the general shift to higher densities of shade-tolerant tree species with absence of fire. However, the magnitude of this shift may be more variable across landscapes than what has been reported in other studies.... While increases in densities of shade-tolerant tree species may be a predictable trajectory of succession following exclusion of fire, Fig. 6 shows that sites exposed to the same number of fires had different overstory structure, and that rates of change due to lack of fire varied from site to site. These results suggest that forest structure and composition at a given moment in time may be difficult to relate to any specific fire frequency or time-since-fire.... This study points to the need for continued research and cautious approaches to management of northwestern ponderosa pine forests. Our findings suggest that even within the relatively coherent PP/DF forest type, fire and absence of fire produce variable effects in the understory and different rates of successional change in the overstory across varied landscapes. Our study supports other recent research that cautions against specific targets for forest structure in restoration treatments, and underscores the importance of natural variability and heterogeneity in ponderosa pine forests, especially in the complex, mixed fire-regime forests of the Northwest. Where possible, management approaches should be site-specific. However, because of the difficulty in obtaining historical information at all locations, **management may need to emphasize restoration of natural ecological processes, especially fire, rather than specific stand conditions.** (Emphasis added.)

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#11

Response to Comment #11: Photo's 1, 2 and 3 on FSEIS pages III-78 and III-79 illustrates the effect of fire suppression on forest composition and stand structure. Photo 1 demonstrates dense Douglas-fir ladder fuels, encroaching on a mature Ponderosa pine. Photo 2 illustrates an overstocked Douglas-fir stand with moderately heavy mortality that has resulted in heavy ground fuels. Photo 3 illustrates a stand that has sustained heavy mountain pine beetle mortality of lodgepole pine, resulting in the development of a combination of heavy down and ladder fuels. The conditions depicted in these three photos are all conducive to stand-replacing crown fire. In contrast, Photo 4 (page III-79) illustrates the effect of silvicultural treatment on stand composition and structure. Before the treatments of thinning, piling and underburning, the stand in photo 4 was similar in structure and composition to the stand in Photo 1. This was an unsustainable condition, susceptible both to crown fire and bark beetle attack. After treatment this stand is in a more sustainable condition, because it is much less susceptible to both bark beetle attack and crown fire. Also the FSEIS on page III-83 states: " Timber harvest and associated prescribed burning can be effective tools in restoring ecosystem health (Mutch 1994). It has been shown numerous times that manipulation of the forest structure reduces the severity of future wildfire events (Agee 1996; Vihanek and Ottmar 1994). Harvest followed by effective fuel treatments has significantly altered wildfire behavior and spread on the Rexford Ranger District. Examples of these effects can be seen within the area of the 2005 Camp 32 Fire (Appendix 4), within the areas of the 1994 North Fork Fire (Hvizdak 1998), and within the areas of the Lydia and Stone Hill Fires of 2000."

#12

Response to Comment #12: This quote from Keeling, et al, is a matter of opinion and not a scientific conclusion based on the synthesis of the data.

#13

The points raised by Keeling et al. (2006) highlight the fact that even where forest structure and composition have been altered by the effective exclusion of fire, the magnitude of structural and compositional change varies greatly and is not generally predictable. The VRU analysis conducted for the Young Dodge DSEIS does not account for this, nor do the proposed treatments. As pointed out in the above cited paragraphs from Baker et al. (2006), recognizing this variability is particularly important for wetter sites of more mixed severity fire regimes as are found in the Young Dodge project area.

#14

Furthermore, although the source of the 15-45 year fire return interval cited in Gautreaux (1999) is not provided, it is important to note that most fire history studies used to determine fire return intervals are conducted in mature or old growth stands, which have the longest fire history records. However, fire effects and summary fire statistics such as the fire return interval may differ greatly in younger, developing stands such as occur in the project area compared to old growth, fire maintained forest stands (Baker et al. 2006). The KNF may actually be confusing the development of young, post-fire stands and the natural processes of succession that were set in motion by past wildfires with the effects of fire suppression.

#15

Given that the KNF's fire management plan for the area includes the continuation of current fire suppression policies, it is unclear how historic fire regimes are to be restored. This is a critical point, as the KNF's 2007 Marten Creek DEIS[2] points out on p. 3-13, "It is important to note that **function cannot be maintained by restoring the vegetative structure, composition and patch size without restoring fire on the landscape. No mechanical means alone can duplicate the unique ecological effects of wildland fire, such as soil heating, nutrient recycling, and the resulting effects to the community composition and structure (Kauffman 2004, Page 880).**" While we are strongly supportive of more frequent and progressive use of prescribed fire in appropriate forest types, there is no evidence that prescribed burning, limited as it is by financial, social,

#16

and political constraints, will ever realistically be capable of affecting similar areal extent or producing similar effects as wildfires under historic wildfire regimes. This is especially true of forests in mixed severity fire regimes, because the FS is highly resistant to igniting or allowing moderate and high severity wildfires, which area a fundamental component of mixed severity regimes. It therefore remains unclear how the KNF will ever arrive and desired conditions since getting there requires the **natural process** of fire it intends to continue excluding from the landscape.

Hutto, 1995 addresses the points emphasized in the paragraphs above:

> Fire is such an important creator of the ecological variety in Rocky Mountain landscapes that the conservation of biological diversity [required by NFMA] is likely to be accomplished only through the conservation of **fire as a process**...Efforts to meet legal mandates to maintain biodiversity should, therefore, be directed toward **maintaining processes like fire, which create the variety of vegetative cover types upon which the great variety of wildlife species depend.** (Emphases added.)

[2] http://www.fs.fed.us/r1/kootenai/projects/projects/marten/documents/deis/marten-creek-deis.pdf

8

Response to Comment #13: Alternative 1M proposes to use twelve silvicultural treatments to achieve the Purpose and Needs of the Young Dodge project (FSEIS II-4 through II-9, and II-20 through II-21). These numbers of treatments are proposed to site-specifically address the variety of conditions that occur in the project area, including the wetter sites of more mixed severity fire regimes.

Response to Comment #14: The KNF recognizes the difference between young, post-fire stands and stagnated stands resulting from years of fire suppression. Proposed treatments have been tailored to the site-specific conditions presented by these stands

Response to Comment #15: Within the FSEIS, the Purpose and Needs A, B, and C on Pages I-4 through 1-7 of the FSEIS, strategies 1, 2, and 3 outlined on Page I-10, the fuel treatment descriptions on page III-83and the Analysis of Direct and Indirect Effect on pages III-84 through III-88 all make a clear connection between the reference conditions associated with a given VRU, its current vegetation and the necessity, utility, and appropriateness of the proposed treatments

Response to Comment #16: The KNF is examining opportunities to allow the natural processes of fire to occur on the landscape through the Forest Plan revision effort. The Young Dodge project has limited areas that would be appropriate for this kind of management because of its location in relationship to communities. The intent of Young Dodge is not to limit opportunities in the future, but to break up contiguous fuels such that fires may be managed at a future date.

It is clear that the KNF does not truly intend to restore the natural process of fire to the landscape as much as it intends, rather, to impose the totally arbitrary goals, based on VRUs, to maintain composition and structure throughout the project area. This is an extension of the FS's obsessive tendency to attempt to control not only the structural and compositional characteristics of entire landscapes but now, in this case, the very process of fire itself and its landscape level effects. There are substantial risks associated with this strategy that are not even remotely acknowledged in the DSEIS. For instance, as has become routine in the modern management paradigm of the FS, the agency employs a perverse and arbitrary conception of restoration to justify this. Moreover, the target goals for fire effects on which the KNF appears to base its strategy for reintroducing fire regimes is the VRU analysis, which as discussed above in relation to the work of Hessburg et al. (2007), does not correlate and cannot predict fire effects (i.e. fire severity) or, therefore, fire regimes. Reintroducing fire regimes based on VRUs would, by definition, lead to stable state fire regimes since, as the KNF states on p. 3-18 of the 2007 Marten Creek DEIS, the "VRU and associated Habitat Types do not change over time, as they are a reflection of a site's inherent ecological capabilities and potential natural vegetation." Stable state fire regimes are totally unnatural within the mixed severity fire regimes (Hessburg et al 2007, Baker et al 2006) such as exist in the Young Dodge project area.

#17

TLC's DEIS comments cited extensively from other scientific research that calls into question the KNF's modeling as it uses Gautreaux, 1999). Schoennagel et al., 2004 state "(W)e are concerned that the model of historical fire effects and 20th-century fire suppression in dry ponderosa pine forests is being applied uncritically across all Rocky Mountain forests, including places where it is inappropriate." Those scientists note that "Dry, low-elevation ponderosa pine forests in the Rocky Mountain region, which were historically characterized by frequent low-severity fire regimes ... comprise much of the ponderosa pine forest in Arizona and New Mexico **but only a small fraction of the ponderosa pine forest in the central and northern Rockies**." (Emphasis added.)

#18

Any forest condition that is maintained through repeated manipulation is not maintaining ecosystem *processes*. The proposed management activities would be alien to the *processes* that naturally shaped the ecosystem and resulted in a range of natural structural conditions. Thus, the need for standards guiding both the delineation of zones where such artificializing fuel reduction actions may take place, and that also address ecological concerns such as snag and down woody debris retention amounts.

#19

As an example, the KNF's reliance on snag retention guidelines is outmoded. It focuses on structures left after logging, instead of maintaining the natural *processes* that result in snag habitat. McClelland (undated) states:

> The snags per acre approach is not a long-term answer because it concentrates on the products of ecosystem processes rather than the processes themselves. It does not address the most critical issue--long-term perpetuation of diverse forest habitats, a mosaic pattern which includes stands of old-growth larch. **The processes that produce suitable habitat must be retained or reinstated by managers. Snags are the result of these processes (fire, insects, disease, flooding, lightning, etc.)** (Emphasis added.)

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Response to Comment #17: The document *Fire Ecology of Western Montana Habitat Types* by Fischer and Bradley (1987) describes the relationships between habitat types and fire regimes. Fire regimes are directly related to the vegetation that dominates the site. We do not disagree that vegetation on a site changes through time, though these changes generally do not occur rapidly without the influence of an insect and disease outbreak or wildfire as the causal factor. However, fuel loadings change steadily over time.

Response to Comment #18: The FSEIS (III-80 – III-83) acknowledges and describes a variety of fire regimes using Vegetative Response Unit descriptions across the Young Dodge project area, including types of fire regimes described by Schoennagel et al.

Response to Comment #19: The proposed management activities are not alien to the ecosystem. They are treatments designed to emulate natural processes. For example, the use of prescribed fire is proposed in place of natural fire. Allowing natural fires to burn unchecked in and around the WUI presents an increase in the risk that private property could be damaged or lost to wildfire. Prescribed fire can be used in appropriate environmental conditions, achieving desired results, with a much smaller risk of loss of private property.

Response to Comment #20: Please see the Snag analysis beginning on page III-165. The Kootenai NF has established optional snag management levels based on local data (Johnson 2005). These snag levels are greater than the KNF Forest Plan snag standards. These recommendations were considered in this analysis as part of the design criteria for snag retention in proposed treatment units. In the long term, the proposed improvement harvests identified in the action alternatives are expected to provide for the continuity of large-diameter ponderosa pine and Douglas-fir. This in turn provides a long-term benefit to cavity-dependent species, as over time they would become snags. The subsequent proposed prescribed underburning would reduce the small-diameter Douglas-fir encroachment, and any trees that may be killed during the burning would result in the creation of snags. Additionally, fire may facilitate decay in surviving trees by providing an entry point for fungi, which increases the likelihood that the trees would be used by cavity excavators (Smith et al 2000).

And Hutto, 1995 addresses the processes topic, talking about fire in that case:

> Fire is such an important creator of the ecological variety in Rocky Mountain landscapes that the conservation of biological diversity [required by NFMA] is likely to be accomplished only through the conservation of fire ***as a process***…Efforts to meet legal mandates to maintain biodiversity should, therefore, be directed toward maintaining processes like fire, which create the variety of vegetative cover types upon which the great variety of wildlife species depend. (Emphasis added.)

Harvey et al., 1994 state:

> Although usually viewed as pests at the tree and stand scale, insects and disease organisms perform functions on a broader scale.
>
> …Pests are a part of even the healthiest eastside ecosystems. Pest roles—such as the removal of poorly adapted individuals, accelerated decomposition, and reduced stand density—may be critical to rapid ecosystem adjustment
>
> …In some areas of the eastside and Blue Mountain forests, at least, the ecosystem has been altered, setting the stage for high pest activity (Gast and others, 1991). **This increased activity does not mean that the ecosystem is broken or dying; rather, it is demonstrating functionality, as programmed during its developmental (evolutionary) history.**

(Emphasis added.) Also, Dudley & Vallauri, 2004 state:

> The most threatening pest for forest managers is the bark beetle and deadwood is often blamed for allowing the bark beetle to infest forests. In fact the evidence suggests that reasonable levels of dead trees are no danger for the forest. On the contrary, several studies seem to show that they shelter a significant group of parasitoids and predators, which more or less control the populations of pests. Although bark beetle numbers increase near significant numbers of fallen logs, research found little evidence for increased tree death as a result, mainly because the species attracted are already highly specialised to dead timber.

The EIS states that a major goal of the project is to improve existing forest stand conditions related to historic vegetation structure and species composition. Noss (2001) addresses composition along with other basic components of the ecosystem:

> Ecosystems have three basic components: **composition, structure, and function.** Together, they define biodiversity and ecological integrity and provide the foundation on which standards for a sustainable human relationship with the earth might be crafted.

Noss goes on to define those basic components:

> **Composition** includes the kinds of species present in an ecosystem and their relative abundances, as well as the composition of plant associations, floras and faunas, and habitats at broader scales. We might describe the composition of a forest, from individual stands to watersheds and regions.

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Structure is the architecture of the forest, which includes the vertical layering and shape of vegetation and its horizontal patchiness at several scales, from within stands (e.g., treefall gaps) to landscape patterns at coarser scales. Structure also includes the presence and abundance of such distinct structural elements as snags (standing dead trees) and downed logs in various size and decay classes.

Function refers to the ecological processes that characterize the ecosystem. These processes are both biotic and abiotic, and include decomposition, nutrient cycling, disturbance, succession, seed dispersal, herbivory, predation, parasitism, pollination, and many others. Evolutionary processes, including mutation, gene flow, and natural selection, are also in the functional category.

#21 In discussing vegetative historic conditions the DSEIS focus tends to be too much on trees, and not enough of the other components of the ecosystem. The DSEIS fails to consider other important components as the FS defined "desired conditions" or "natural conditions" for the Young Dodge Project area. These include amount of interior mature and old-growth forest, amount and size distribution of snags, amounts and distribution of coarse woody debris, and soil conditions and land productivity. Since we fully expect that many of those components are not within the natural range of conditions due to past logging activities, managing for genuine ecological sustainability would prioritize restoration of those components, or at the very least would not push those conditions further outside the range of natural conditions. Noss (2001) believes, "If the thoughtfully identified critical components and **processes** of an ecosystem are sustained, there is a high probability that the ecosystem as a whole is sustained." (Emphasis added.)

#22 Appellants believe that maintaining critical **processes** (also Noss's "function") is being overlooked in focusing on "desired conditions." A prime example is wildland fire. The DSEIS's goal of enhancing fire suppression control efforts will also push the ecosystem's conditions farther outside the natural range.

#23 In its narrow worldview that sees the effects of insects and tree diseases as evidence the ecosystem is somehow broken, the FS demonizes dynamic ecosystem processes, that are vitally important for providing wildlife habitat components and that provide for the cycle of life found in the most fundamental matrix of forest ecosystems—the soil. The proposal reflects a lack of understanding of the role of pest organisms, similar to the simple-minded "Smokey Bear" campaign against wildland fire, which at the root of it has sought to maintain trees for eventual "harvest" rather than maintaining healthy forest ecosystems.

#24 The DSEIS makes statements and assumptions about historical conditions and desired future conditions, most of them based upon grossly inadequate data. Information regarding historic conditions is incomplete; altering particular sections of forest in order to achieve "historic" conditions may not make sense when the forest as a whole has already been fundamentally changed; many variables can affect treatment outcomes; and the treatment process is qualitatively different from the "natural" or "historic" processes it is intended to mimic. The FS is altering the composition of habitat through an invasive process.

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Response to Comment #21: Components other than trees including wildlife, old growth, snags, down wood material, fisheries, soil, water, and sensitive plants have been analyzed in this FSEIS. Please see the respective sections in Chapter 3.

Response to Comment #22: The purpose and need (pages I-4 – I-7) and the strategies (I-9) of the Young Dodge FSEIS do not address "enhancing fire suppression". As described in the document, the intent is to create fuel breaks and reduce natural fuel accumulations to allow a safer environment for fire fighters and public during fire episodes. The distribution of treatment units may allow for opportunities to allow natural fire in the future.

Response to Comment #23: The FSEIS recognizes the important role insects and disease play in forest ecosystems. Page III-30 states "Forest insects and disease have also played a role in shaping vegetative patterns and diversity. When occurring at endemic levels, insects and disease can increase diversity and create important structural attributes such as snags and coarse woody debris for wildlife habitat, and openings in the canopy that allow regeneration of seral species and increase in browse species"

Response to Comment #24: The desired future conditions in the FSEIS are based on goals and objectives identified in the Forest Plan.

The DSEIS's silvicultural discussions are disturbingly detached from empirical data. None of the manipulate-and-control actions regarding fire, stand treatment, and forest health have been subject to testing in the field, and no verification is even considered in the DSEIS.

The FS wants to enter into some of the few unlogged, still essentially natural stands in the project area to conduct still more silvicultural experiments it has no intention of validating.

Baker and Ehle, 2001 present theory and empirical results that suggest that fire-history data have uncertainties and biases when used to estimate the population mean fire interval or other parameters of the fire regime. From their Abstract:

> Present understanding of fire ecology in forests subject to surface fires is based on fire-scar evidence. We present theory and empirical results that suggest that fire-history data have uncertainties and biases when used to estimate the population mean fire interval (FI) or other parameters of the fire regime. First, the population mean FI is difficult to estimate precisely because of unrecorded fires and can only be shown to lie in a broad range. Second, the interval between tree origin and first fire scar estimates a real fire-free interval that warrants inclusion in mean-FI calculations. Finally, inadequate sampling and targeting of multiple-scarred trees and high scar densities bias mean FIs toward shorter intervals. In ponderosa pine (*Pinus ponderosa* Dougl. ex P. & C. Laws.) forests of the western United States, these uncertainties and biases suggest that reported mean FIs of 2–25 years significantly underestimate population mean FIs, which instead may be between 22 and 308 years. We suggest that uncertainty be explicitly stated in fire-history results by bracketing the range of possible population mean FIs. Research and improved methods may narrow the range, but there is no statistical or other method that can eliminate all uncertainty. Longer mean FIs in ponderosa pine forests suggest that (*i*) surface fire is still important, but less so in maintaining forest structure, and (*ii*) some dense patches of trees may have occurred in the pre-Euro-American landscape. Creation of low-density forest structure across all parts of ponderosa pine landscapes, particularly in valuable parks and reserves, is not supported by these results.

II. MORE ON SCIENTIFIC INTEGRITY

The Response to comments ignored our references (Ruggiero, 2007 and Sullivan et al., 2006) on the integrity and reliability of the DSEIS's use of science. The DSEIS completely sidesteps the issue of potential bias in FS decisionmaking and therefore failed to respond to concerns about its scientific integrity. However, NEPA does not allow the FS to continue to simply ignore the issue.

The DSEIS relies upon unpublished references such as those from Forest Service biologists Samson and Johnson to claim that it is utilizing effective conservation strategies that will maintain viable populations of wildlife. And it relies upon other habitat modeling, depending upon the species discussed. However, none of those methodologies have been subject to independent scientific peer review, to validate them for the ways the KNF utilizes them.

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Response to Comment #25: The scientific literature from the early 1900's to the present day is rife with empirical studies demonstrating the effectiveness of silvicultural treatments in attaining their stated objective. One of these studies specific to the effective of silvicultural treatments on crown fire severity is the 2002 study by Pollet and Omi "Effect of thinning and prescribed burning on crown fire severity in ponderosa pine forests". In this study the authors found that crown fire severity was mitigated in stands that had some type of fuel treatment compared to stands without any treatment. At all four of the study sites, the fire severity and crown scorch were significantly lower at the treated sites. This study is particularly relevant to the Young Dodge project because one of the study site, the Webb fire" is less than 15 miles from the Young dodge project area. Also concerning this topic, the FSEIS on page III-83 states: "Timber harvest and associated prescribed burning can be effective tools in restoring ecosystem health (Mutch 1994). It has been shown numerous times that manipulation of the forest structure reduces the severity of future wildfire events (Agee 1996; Vihanek and Ottmar 1994). Harvest followed by effective fuel treatments has significantly altered wildfire behavior and spread on the Rexford Ranger District. Examples of these effects can be seen within the area of the 2005 Camp 32 Fire (Appendix 4), within the areas of the 1994 North Fork Fire (Hvizdak 1998), and within the areas of the Lydia and Stone Hill Fires of 2000."

Response to Comment #26: The prescribed silvicultural treatments were designed to attain the objectives of the Purpose and Need as specified on FSEIS pages I-4 through I-7, not to test scientific hypothesis. A monitoring plan is specified in Appendix 3 of the FSEIS to insure that objectives are being attained and to use the monitoring results to adaptively manage the implementation of the project.

Response to Comment #27: The FSEIS does not ignore references. The commenters provided a lengthy list of references, all of which were reviewed by the ID Team for their applicability to the project. In some cases, the references were consistent with scientific information already being used, in other cases the information was not applicable to the project, and finally some of the material was incorporated into the analysis. The literature review table (Pages IV–103 through IV-128) immediately following the response to comments lists the various references provided and how that information was utilized.

NEPA documents such as this DSEIS must also be judged as to the reliability of the data and modeling methodology used to support analyses. Huck (2000) states: The basic idea of reliability is summed up by the word consistency. Researchers can and do evaluate the reliability of their instruments from different perspectives, but the basic question that cuts across these various perspectives (and techniques) is always the same: **"To what extent can we say the data are consistent?" ...(T)he notion of consistency is at the hart of the matter in each case.** ...Some researchers, when discussing reliability, will present a numerical value for the standard error of measurement. Often abbreviated as SEM, the standard error of measurement can be used to estimate the range within which a score would likely fall if a given measured object were to be re-measured. To illustrate, suppose an intelligence test is administered to a group of children, and also suppose Tommy ends up with an IQ score of 112. If the SEM associated with the IQ scores in this group were equal to 4, then we would build an interval for Tommy (by adding 4 to 112 and subtracting 4 from 112) that would extend from 108-116. This interval, or "confidence band," would help us interpret Tommy's IQ because we could now say that Tommy would likely score between 108 and 116 if the same intelligence test were to be readministered and it Tommy didn't change between the two testings. (Footnote: By creating an interval via the formula "score±SEM," we end up with a 68 percent confidence band. If we doubled or tripled the SEM within this little formula, we would end up with a 95 percent or a 99 percent confidence band, respectively.) In a very real sense, the standard error of measurement can be thought of as an index of consistency that is inversely related to reliability. To the extent that reliability is high, the SEM will be small (and vice versa). **...(R)eliablility coefficients really apply to data and not to measuring instruments.** ...(R)emember, therefore, that reliability is conceptually and computationally connected to the data produced by the use of a measuring instrument, not to the measuring instrument as it sits on the shelf. ...Finally, keep in mind that reliability is not the only criterion that should be used to assess the quality of data. **A second important feature of the data produced by measuring instruments (or raters) has to do with the concept of validity.** ...Whereas the best one-word synonym for reliability is consistency, the core essence of validity is captured nicely by the word accuracy. **...(A) measuring instrument is valid to the extent that it measures what it purports to measure.** ...It is possible for a researcher's data to be highly reliable even though the measuring instrument does not measure what it claims to measure. However, an instrument's data must be reliable if they are valid. ...(A)n important question concerns the degree to which the various items collectively cover the material that the instrument is supposed to cover. This 13	#28	Response to Comment #28: The individual resource sections disclose the limitations and assumptions made during the analysis process. Documents do not have to be peer reviewed to contain relevant and useful information. As noted, the documents in question were developed using peer reviewed references and are consistent with that science. The documents referenced in this comment (Johnson and Samson) were prepared by agency wildlife biologist/wildlife ecologists with many years of experience in natural resource management.

question can be translated into a concern over the instrument's content validity. Normally, **an instrument's standing with respect to content validity is determined simply by having experts carefully compare the content of the test against a syllabus or outline that specifies the instrument's claimed domain. Subjective opinion from such experts establishes—or doesn't establish—the content validity of the instrument.** (Emphases added.) Despite its silence in response to comments on this issue, the FS is quite aware of the need for the data gathered to support its analyses to be consistent and therefore reliable. In its "Response to Motion for Preliminary Injunction" brief in recent litigation on the KNF, stated in regards to a scientific report it was criticizing: "(Its) purported 'statistical analysis' reports no confidence intervals, standard deviations or standard errors in association with its conclusions." As pointed out in our above cite of Huck (2000), the notion of "standard deviations or standard errors" that the FS brought up in the context of litigation relates to the reliability of the data, which in turn depends upon how well-trained the data-gatherers are with their measuring tools and measuring methodology. In other words, different observations of the same thing must result in numbers that are very similar to result in small "standard deviations or standard errors" and thus high reliability coefficients, which in turn provide the public and decisionmakers with an idea of how confident they can be in the conclusions drawn from the data. The next level of scientific integrity relates to the notion of Huck's (2000) "validity." As Huck explains, the degree of "content validity," or accuracy of the model or methodology is established by utilizing other experts. This, in turn, demonstrates the necessity for utilizing the peer review process. The validity of the various models utilized in the DSEIS's analyses have, by and large, not been established for the uses the FS employs them, simply because **the FS refuses to utilize the expert peer review process to establish their content validity.** Likewise, the failure to utilize peer review of some the references utilized by the FS[3] (such as Samson 2006, and the various KNF wildlife models created by Johnson) means the validity of those models as well as the conclusions arrived at in those references are highly questionable. The points made by Sullivan et al., 2006 need to be well-taken: Peer review.—A basic precept of science is that it must be verifiable, and this is what separates science from other methods of understanding and interpreting nature. The most direct method of verification is to redo the study or experiment and get the same results and interpretations, thus validating the findings. Direct verification is not always possible for nonexperimental studies and is often quite expensive and time-consuming. Instead, scientists review the study as a community to assess its validity. This latter approach is **the process of peer review, and it is necessary for evaluating and endorsing the products of science. The rigor of the peer review is one way to assess the degree to which a scientific study is adequate for informing management decisions.** The use of peer review in applied sciences such as fisheries, natural resource, and environmental science has proven [3] Especially those not from the FS's "research arm" which Ruggiero (2007) suggests has "independence and objectivity" as opposed to the FS's "management arm." 14	#29	Response to Comment #29: The models in question here were developed using peer reviewed references and are consistent with that science. In addition, the limitations of those models and assumptions made during the modeling process are contained in the FSEIS or Project File.

to be problematic because there are two components to consider, the science and the policy based on it.

Peer review has a different meaning to scientists than it does to the public. To scientists, peer review is a formal process conducted by active, knowledgeable experts in the general field of the study of interest. The peer review covers (1) the validity of the methods used, (2) whether the methods and study design adequately address the objectives, (3) whether the results that are reported are adequate for interpretation, (4) whether the results support the conclusions, and (5) whether the findings represent a significant advance in scientific knowledge. Typically, several knowledgeable scientists conduct the review independently and anonymously.

While the scientific community is primarily interested in the validity of the research, the public and policymakers are is more interested in the impact of science on societal decisions. Thus the basis for judging science differs, as does the meaning of valid evidence (Clark and Majone 1985). The policy implications of science are judged not only on the basis of its quality but also regarding how it influences the public. Science, as well as discussions of "best" science, become controversial to nonscientists only when it has the potential to change societal policy. **In any peer review process, the selection of reviewers helps set the tone for the critique.**
In a scientific peer review, reviewers are selected because they are thought to be fair, unbiased, and knowledgeable, and anonymity is preserved to encourage frankness. For public reviews, reviewers are often selected because they can articulate opposing points of view, and reviewers' identities and credentials are revealed, helping to inform the debate.

(Emphases added.) In response to TLC's comments on the 2008 Brush Creek Fire Project EA, the KNF stated, "The relevant conservation assessments were provided by Sampson (2006) whose viability findings were based on peer reviewed science." But an entirely biased biologist or even an under-educated person can create conservation assessments "based on peer reviewed science," however loosely or erroneously. The KNF also responded, "Wildlife habitat models used on the KNF are built on habitat parameters from peer reviewed, published science reports. While various reports from Forest Wildlife Biologist Wayne Johnson are unpublished, they are based on peer reviewed research, locally obtained monitoring results, and data provided by biologists from other agencies such as the U.S. Fish and Wildlife Service." But the issue remains, are the conservation assessments and models **themselves** valid for the purposes for which the KNF utilizes them? Only unbiased scientific peer review can assist the public and decisionmaker to make that determination. And that's what is entirely lacking. **Since the FS has failed to provide the public with the necessary scientific peer review, the public is deprived of its right to fully participate in the process.**

III. MORE ON CUMULATIVE EFFECTS

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The discussion about past and ongoing activities, regarding land of all ownerships, is far too cursory for understanding cumulative effects. We believe that in order to properly assess cumulative effects, as per the Ninth Circuit's *Lands Council v. Powell* decision, the FS must not only quantify the acres and point to locations of past and ongoing actions, but the FS must also state the goals of its own projects and if those goals were met, indicate if any assumptions underlying those projects' "purpose and need" statements were correct, and disclose significant monitoring information related to potentially similar impacts from the Young Dodge timber sale. Indeed, past logging activities, regardless of ownership at that time, have in many ways led to the current proposal's stated purpose and need.

#30 There's no real understanding in the agency as to just how its past management has resulted in the existing conditions or if, in fact, those were the intended conditions based upon repeated rounds of heavy-handed management. There is lack of a comprehensive cumulative effects analysis in the DSEIS of the past logging and other management activities in the project area.

#31 The DSEIS fails to include an analysis of how its previous actions accomplished (or failed to accomplish) previous projects' goals. Nor was there an analysis of the success of monitoring and mitigation specified in that, or any previous NEPA document.

#32 The Ninth Circuit Court of Appeals, in *Lands Council v. Powell*, stated: "[c]umulative effects analysis requires the [FEIS] to analyze the impact of a proposed project in light of that project's interaction with the effects of past, current, and reasonably foreseeable projects… [Here] there is no discussion of the connection between individual harvests and the prior environmental harms from those harvests that the Forest Service now acknowledges." Just as in *Lands Council v. Powell*, the Young Dodge DSEIS fails to consider how past projects in the same area have led to a situation the FS claims it is responding to in the "Purpose and Need" statement.

The Young Dodge DSEIS is written without consideration of highly relevant information from past projects in the very same project area. Perhaps the best example is the West Kootenai Ecosystem Restoration Project (Decision Notice signed June 15, 1999). Implemented almost entirely within Young and Dodge Creeks, the West Kootenai Ecosystem Restoration (WKER) Project was proposed to respond to the needs as stated in that EA: "There is an ecological need to restore fire into this fire dependent ecosystem" and to "Reduce the potential for severe, uncontrollable wildfires to occur in an urban-wildland interface setting, through reduction of natural and human-caused fuels and reintroduction of prescribed fire." (WKER EA at pp. 3, 4.) The WKER Project was focused on the roughly 40% of the Young Dodge project area closest to the Koocanusa Reservoir and the settlement of West Kootenai.

Appeal Attachment 1 is a full-color map of the "Selected Action" from the WKER DN, showing the vast extent of commercial thinning, regeneration harvest, noncommercial thinning/underburn activities designed to respond to the above "needs." The Selected Alternative included 1,356 acres of commercial thinning (logging) and 88 acres of regeneration logging (WKER DN at 8). It also included 1,684 acres of "slashing followed by underburning…to reduce fuels …where commercial timber harvest is not economically viable" (Id. at 9).

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Response to Comment #30: In 2008, the Forest Service issued its own NEPA regulations. These regulations discuss how the cumulative effects of past actions should be catalogued (36 CFR 2201.4(f)). It states "With respect to past actions, during the scoping process and during subsequent preparation of the analysis, the agency must determine what information regarding past actions is useful and relevant to the analysis of cumulative effects." Each resource considered those past actions that were still having a cause-effect relationship on the areas where there direct and indirect effects from the Young Dodge project. For example, in the analysis for water quality; all past actions that were still contributing to water yield were considered in the water yield calculations; in the analysis for grizzly bears, all past activities affecting habitat effectiveness were considered in the habitat effectiveness analysis. Past activities are presented on Page III-1-2 of the FSEIS and discussed in the Cumulative Effects for each resource area. Cumulative Effects worksheets for each resource are included in the Project File. In addition, each section has a summary of existing conditions in the cumulative effects section. This section summarizes the effects from the relevant past actions. The regulations go on to say "The CEQ regulations, however, do not require agencies to catalogue or exhaustively list and analyze all individual past actions. Simply because information about past actions may be available or obtained with reasonable effort does not mean that it is relevant or necessary to inform decision making."

Response to Comment # 31: Monitoring of past actions on the Forest is presented in Monitoring reports. These monitoring reports are available on the Kootenai National Forest Website at: http://www.fs.usda.gov/kootenai/publications/

Response to Comment #32: The past projects that occurred in the Project Area were disclosed on pages III-2 of the FSEIS. In some cases, past actions such as timber harvest lead to a mosaic of openings across the landscape. This situation is explained in the vegetation section beginning on page III-33.

Map 2-1 in the Young Dodge DEIS displays the Selected Alternative for the current project. Extensive areas within the WKER project area are now to be treated under the Young Dodge ROD, with the two projects having essentially the same purposes in the overlapping area. Appellants TLC were not convinced the WKER project would accomplish what the FS said it would in terms of meeting that project's stated "needs," expressing their concerns in very detailed comments both on the WKER EA and Supplemental EA (*see* Appeal Attachments 2 and 3). And it is clear from the large extent of treatment now proposed in the overlapping area that we were correct in our concerns. Furthermore, even in the areas treated in the WKER Project, the Young Dodge EIS now indicates the fuel situation is already undesirable. Comparing WKER Selected Action map (Appeal Attachment 1) with Young Dodge DEIS map 3-6, one can easily do a quick eyeball comparison that reveals many areas that were treated since the 1999 DN now are considered to be either FRCC 2 or FRCC 3. The DEIS defines those two conditions, respectively, as: **Condition Class 2** – fire regimes have been moderately altered from their historic range; there is a moderate risk of losing key ecosystem components; fire frequencies have increased or decreased by one or more intervals from their historic range; vegetation and fuel attributes have been moderately altered, resulting in potential changes to one or more of the following: fire size, intensity and severity, and landscape patterns. **Condition Class 3** – fire regimes have been drastically altered from their historic range; the risk of losing key ecosystem components is high; vegetation has been substantially altered from its historic range; fire frequencies have departed from historic frequencies by multiple return intervals, resulting in dramatic changes to one or more of the following: fire size, intensity, severity, and landscape patterns. (DEIS at III-53.) In fact, it is surprising how the two maps we refer to have so little correspondence between current Condition Class and recent WKER treatments. So what happened since the WKER project implementation to lead to this disconcerting FRCC 2 and 3 situation over much of the WKER project's treated areas? Appellants maintain that the only logical answer is that the WKER project didn't deliver. So why would be expect the Young-Dodge project to deliver now? As the Ninth Circuit's decree in *Lands Council v Powell* regarding cumulative effects clearly states, the answer must be provided in the Young Dodge DSEIS. It isn't. **IV. GRIZZLY BEAR** **Status of the Cabinet-Yaak Grizzly Bear Population** In 1999 the US Fish and Wildlife Service (FWS) found the Cabinet-Yaak grizzly bear population to be "warranted, but precluded" for reclassification to endangered status. This finding noted 17	#33	**Response to Comment #33:** Implementation of the West Kootenai Ecosystem Restoration (WKER) treatments resulted in desired conditions being achieved within treatment areas. Continued suppression of wildfires (both human caused and natural caused) results in the continued growth of vegetation. The Young Dodge project proposes to continue similar treatments to sustain the desired conditions across the landscape.

that the grizzly population in the Cabinet-Yaak ecosystem was very small and faced considerable threats to its continued existence, including displacement from logging activities and mining, road building, and recreational activities. Thus, the Cabinet-Yaak grizzly population is *de facto* endangered. The grizzly bear population of the Cabinet-Yaak ecosystem is critically endangered due to its isolation from other grizzly populations as well as its very small size, which is estimated to be 30-40 bears. When populations become very small, they can enter into an irreversible decline, known as an "extinction vortex." Extinction risks for grizzly bears become severe whenever populations are less than 50. After FWS's finding in 1999 that the Cabinet-Yaak population is warranted for endangered status, grizzly mortalities increased dramatically in the Cabinet-Yaak ecosystem (CYE). Sixteen known mortalities occurred the CYE during the seventeen year period from 1983-1998. Twenty-four known grizzly bear mortalities occurred during the six year period from 1999-2005 including at least 7 females and a number of cubs. Recent reports indicate that an adult female grizzly with cubs was killed in the fall of 2007. Scientific research and the best available information indicate that there is a high probability that the grizzly bear population in the CYE has declined for some period and that the decline has accelerated. As stated in the DEIS, in 2006 FWS biologist Wayne Kasworm determined that there is a 91% probability that the populations is in a downward trend. (DEIS at III-154, citing Kasworm et al 2006). The DEIS also states that, "[b]ear activity in the impacted BMU includes: one sighting of a female with young in the North Fork of Dodge Creek (1998); one sighting of a female with young in Porcupine Creek (1999); four mortalities since 1990 (3 in Montana; 1 in British Columbia); and several other sightings or sign documented since 1973 within this BMU." Id. The western end of the Young Dodge project area lies within the boundaries of BMU 16. The remainder lies within the designated West Kootenai BORZ.[4] Thus there is a strong possibility that grizzly bears are present and will be affected by the implementation of the selected alternative. The DSEIS failed to give adequate consideration to the potential for project activities to adversely affect individual bears, which, due to the small size of the population, would increase the risk of extinction for the *de facto* endangered Cabinet-Yaak grizzly population. **A. The Forest Service's Reliance on Outdated Forest Plan Standards, Outdated Guidelines and the Defunct Interim Access Rule Set to determine the impacts of the Young Dodge Project on Grizzly Bears is Arbitrary and Capricious and in violation of the Endangered Species Act.** Section 7 of the ESA includes both a substantive and procedural component directing the Forest Service to use their existing authority to "conserve" threatened and endangered species and, in consultation with the U.S. Fish & Wildlife Service ("FWS"), to ensure that their actions do not [4] A "BORZ" is an area adjacent to a grizzly bear recovery zone that the Forest Service has determined to be occupied by grizzly bears. 18	#34	Response to Comment # 3: The FSEIS thoroughly discussed the potential effects on the grizzly bear and its habitat beginning on page III-253 of the document. The Young Dodge project also included elements specifically designed to reduce the amount of edge effect in the planning unit and improve grizzly bear foraging in the future. Post-project effects include improving the habitat conditions of BMU 16 of the Cabinet-Yaak Recovery Zone by increasing the amount of secure core habitat from 53 to 54% which continues its positive trajectory.

jeopardize listed species or destroy or adversely modify critical habitat. 16 U.S.C. §§ 1536 (a)(1), (a)(2).

Pursuant to section 7 of the ESA, "Federal agencies shall, in consultation with and with the assistance of the [FWS], utilize their authorities in furtherance of [the ESA] . . . by carrying out programs for the conservation of endangered species and threatened species." 16 U.S.C.§ 1536(a)(1). The term "conservation" means the "use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided by [the ESA] . . . are no longer necessary." 16 U.S. C. §1532(3).

The ESA's obligations to conserve listed species and ensure against a likelihood of jeopardy requires the agencies to give the benefit of the doubt to listed species like grizzly bears, wolves, and lynx and to place the burden of risk and uncertainty on the proposed management action. See *Sierra Club v. Marsh*, 816 F.2d 1376, 1386 (9th Cir. 1987). In addition, in fulfilling the requirements of section 7 of the ESA, each agency is required to "use the best scientific and commercial data available." 16 U.S.C. § 1536 (a)(2).

As noted in the DEIS, the 2002 FEIS and 2004 ROD for the Grizzly Bear Access Management Forest Plan Amendments for the Kootenai, Idaho Panhandle and Lolo National Forests in the Cabinet-Yaak and Selkirk Grizzly Bear Recovery Zones ("access amendments") were remanded on December 13, 2006 by Federal District Court Judge Donald Molloy with an order to prepare a new environmental analysis. Judge Molloy ruled that the access amendment FEIS and ROD were in violation of NEPA due to the Forest Service's failure to acknowledge a major shortcoming in the scientific report on which the access criteria were based. On May 17, 2007 the US Fish and Wildlife Service withdrew the 2004 Biological Opinion for the Grizzly Bear Access Management Forest Plan Amendments (2004 BiOp).

The Forest Service has stated that it is in the process of revising the grizzly bear access management plan. The new plan will undergo NEPA analysis and section 7 consultation prior to being formally adopted by the Forest Service. All Forest Service projects that may affect grizzly bears in the KNF should have been placed on hold until legally sufficient access management criteria are developed and adopted by the Forest Service, having undergone NEPA and ESA section 7 consultation. However, rather than take this conservative approach to ensure protection and restoration of the de facto endangered Cabinet-Yaak grizzly bear population, the KNF announced its intention to rely on pre-access amendment grizzly bear management standards and guidelines to determine the effects of proposed timber sales on grizzlies, which is in violation of ESA.

KNF Wildlife Biologist Wayne J. Johnson prepared an unpublished paper dated December 30, 2006 entitled "Grizzly Bear Analysis Requirements in light of Judge Molloy's December 13, 2006 decision to set aside the 2002 FEIS and 2004 ROD for the Access Amendment." The paper announces that the Forest Service will use habitat parameter standards that were in place prior to the 2004 access management amendment to determine the effects of proposed actions on grizzly bears.

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#35

Response to Comment #35: The Record of Decision for the Forest Plan Amendments for Motorized Access Management with the Selkirk and Cabinet-Yaak Grizzly Bear Recovery Zones was signed on November 9, 2011. Projects on the Forest, such as Young Dodge, will be consulted upon with the USFWS on an <u>individual basis</u> and will be compliant with laws, regulations, and policies, such as ESA, before continuing with implementation or being considered an unviable project. Concurrence for the Young Dodge project from the USFWS was received on 3/9/2012.

According to the DEIS, "[t]hese requirements come from the 1987 KNF Forest Plan, the 1995 Amended Biological Opinion and Incidental Take Statement on the 1987 KNF Forest Plan, the Selkirk/Cabinet-Yaak Grizzly Bear Interim Access Management Rule Set (12/1/1998), and the Settlement Agreement with the Alliance for the Wild Rockies (3/25/2001)." (DEIS at III-154.)

The Interim Access Rule Set was never subjected to ESA section 7 consultation or NEPA impacts analysis and public review protocols. Therefore, the Rule Set still suffers from the same deficiencies that triggered AWR's lawsuit in 2000, which led to the development of grizzly bear access management standards that were formally adopted as KNF Forest Plan amendments in 2004. The Forest Service's decision to rely on the Interim Access Rule Set is therefore arbitrary and capricious.

Moreover, reliance on outdated 1987 Forest Plan standards and stipulations in the 1995 Amended Incidental Take Statement for the KNF Forest Plan to replace the coverage provided by the scientifically updated 2004 access amendment BiOp is also arbitrary and capricious.[5] It has not been determined whether meeting the array of pre-access amendment grizzly bear management standards will result in "take," e.g., harm, the Cabinet-Yaak grizzly bears.

The outdated and defunct access management rules and guidance that the Forest Service has stated it will rely on are clearly not based on the best available science, contrary to ESA requirements, which, as noted above, require agency determinations regarding the effects of actions on listed species to be based on the best available science.

#36

Response to Comment #36: The Record of Decision for the Forest Plan Amendments for Motorized Access Management with the Selkirk and Cabinet-Yaak Grizzly Bear Recovery Zones was signed on November 9, 2011. Projects on the Forest, such as Young Dodge, will be consulted upon with the USFWS on an <u>individual basis</u> and will be compliant with laws, regulations, and policies, such as ESA, before continuing with implementation or being considered an unviable project. Concurrence for the Young Dodge project from the USFWS was received on 3/9/2012.

As noted in the DEIS, a portion of the East Fork Bear Management Unit 16 of the Cabinet-Yaak recovery zone is located within the project area. The remainder of the project is in the West Kootenai grizzly bear occupied area outside the recovery zone ("West Kootenai BORZ"). The DEIS states that the boundary for cumulative effects and making an effects determination for grizzly bears is the recovery zone and/or the West Kootenai BORZ.

Project related actions that will occur within BMU 16 include Unit 46, a large burn, which is located in grizzly bear core area and 431 acres of roadside salvage logging (DEIS at III-160) that will occur along FR 303. The DEIS indicated that the purpose of the prescribed burn is restoration of high elevation white bark pine habitat, which according to personnel has deteriorated due to the long term Forest Service wildfire suppression policy. The DSEIS does not, however, provide a scientific basis or assurance that the large burn will be successful in accomplishing that goal. It also does not disclose the potential for negatively impacting grizzly

[5] The 2004 access management criteria signaled a shift in grizzly bear management from 1987 KNF Forest Plan standards which relied on limiting linear open road densities to .75 mi./sq.mi. and achieving 70% "habitat effectiveness" in BMUs, to 'new' grizzly bear access management criteria established in the 1990's by grizzly researchers in the NCDE. The new access management, which established criteria based on levels of total and open road densities that research indicated female bears tolerated and minimum amounts of secure core area per BMUs that female bears used, was based on the "moving windows" analysis. Thus the "science" that was the basis for the 1987 Forest Plan standards had been superseded by a new approach to access management for grizzlies. The 1995 Amended Biological Opinion for the KNF FP merely admonished the KNF to proceed to adopt grizzly bear standards based on the new NCDE approach, as directed by the IGBC.

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#37

Response to Comment #37: The success of the prescribed burn for whitebark pine, a known forage item of grizzly bears, will largely be dependent on biological conditions including the burning window, reduction of competition for space and nutrients, and seed dispersion. The potential effects of the prescribed burn, including the effects of using a helicopter, is described on pages III-260 & 267 of the DSEIS under direct and indirect effects and the potential effects of the roadside salvage, is described as part of the effects of timber harvesting, again on page III-267. Effects of the post and pole harvesting were purposely described individually because of its location in relation to the Cabinet-Yaak Recovery Zone.

bears and other wildlife due to the disturbance caused by burning 400 acres. Moreover, the potential impacts of the disturbance of the roadside salvage on grizzly bears are not addressed. The remainder of the project, including 1927 acres of regeneration logging (a total of 2717 acres of logging plus 200 acres of pre-authorized post-sale salvage) and many miles of road reconstruction and other road work, will take place in the West Kootenai BORZ. (ROD at 14.0 The ROD relies on standards that were established in the 2004 access amendment BiOp for areas occupied by grizzlies outside the recovery zone boundaries as a means of measuring the effects of the project on grizzly bears. The criteria in the 2004 BiOp and the DEIS are 3.0 mi./sq.mi. linear total road density; 1.3 mi./sq.mi. open road density. (DEIS at III-159.) These densities were the existing condition in 2002. These criteria, like the access standards for BMUs within the Cabinet-Yaak Recovery Zone, are no longer valid because of the court ruling and the subsequent withdrawal of the access amendment BiOp. Therefore, conformance with them cannot be relied upon to comply with the ESA and avoid "take", and/or jeopardy to grizzly bears. Furthermore, the MA 12 open road density standard of 0.75 mi./sq.mi. (which is also the 1987 Forest Plan standard for grizzly bears) will be violated, reducing security in the project area not only for big game but also for grizzly bears that may occupy the area. The potential for the increase in open road density in the West Kootenai BORZ to adversely affect grizzly bears is not addressed in the grizzly bear analysis. **B. The Forest Service Determination that the Project "May Affect but is Not Likely to Adversely Affect" Grizzly Bears is Without Scientific Basis and is Arbitrary and Capricious** According to the ROD, "[a]s required by the Endangered Species Act, a Biological Assessment was prepared which addressed the potential impacts to these species. The analyses concluded that this project may affect but is not likely to adversely affect the grizzly bear…. This assessment has been reviewed by the U.S. Fish and Wildlife Service, which issued written concurrence with these findings on March 28, 2008. Documentation is contained in the Wildlife Project File." (ROD at 37.) The Forest Service's determination that the project is not likely to adversely affect grizzly bears is arbitrary and capricious for all the reasons stated above, including the fact that relying on pre-amendment criteria to determine whether the project will adversely affect grizzly bears is lacking a scientific basis.[6] As stated above, the "science" behind the re-adopted 1987 Forest Plan standards and other re-adopted management criteria is no longer "the best available science." And the 1998 Interim Rule Set, which is also being relied on, has never been determined, via section 7 consultation, to avoid harm to bears by providing them with adequate secure habitat. **C. The Grizzly Bear Analysis and the ROD ignore the Fact that the Project will Impact an Important Linkage Zone for Grizzly Bears.** [6] The FWS concurrence with the Forest Service "Not Likely to Adversely Affect" determination for the Young Dodge project is also arbitrary and capricious for all the same reasons. 21	#38	Response to Comment #38: The potential effect (displacement acres) of all open roads used for timber harvest activities, is described on page III-267 and includes miles contributing to the existing condition for open road density in MA12. The current open road density for MA12 is 0.81 mi/sq.mi.(see MIS Table 3-2 on page III-183); none of the action alternatives exceed the current baseline condition. Alternative 3 was created to meet all FP standards and guidelines including the MA12 open road density to minimize the potential effects on grizzly bear and big game. The habitat effectiveness for grizzly bear as well as elk as the MIS for big game is given in Table 3-2 (page III-183) and is appropriate because many of the standards associated with habitat management for grizzly bear derived from early management strategies/concepts for big game.

The DSEIS ignores the fact that the project area is part of an existing or potential linkage zone between the Cabinet-Yaak and Northern Continental Divide Grizzly Bear Recovery Zones. The FWS and the Forest Service have acknowledged the importance of establishing and protecting functional linkage zones between grizzly bear recovery zones in order to insure the recovery and long-term viability of grizzly bear populations. The location of the project area between the two recovery zones and the fact that it is located within an area that is occupied by grizzlies heighten the importance of providing adequate security for grizzlies and avoiding disturbances and conditions that would prevent their use of the area as a travel corridor between the two recovery zones. Increasing the risk of mortality in the linkage zone during and after project implementation was not addressed in the grizzly bear analysis. #39

Furthermore, according to the DSEIS the selected alternative will create several large opening and remove hiding cover that provides wildlife movement corridors between open (previously logged) areas.[7] Thus it will eliminate some of the existing movement corridors for big game and other wide-ranging species such as the grizzly bear in the project area. The potential for adverse effects to grizzly bears, such as their avoidance of the area due to the reduction in security provided by cover was not addressed or considered in the grizzly bear effects analysis. The DSEIS fails to address the impacts of the reduction in movement corridors on grizzly bears that occupy the area or that may be moving across the project area. #40

As stated above, the standards that were adopted in the 2004 Access Amendments BiOp for BORZ have been struck down and therefore cannot be relied on by the Forest Service to provide adequate security for bears. Aside from that fact, the standards are per se inadequate to reduce the risk of mortality in the West Kootenai BORZ. They merely maintain the status quo in terms of open and total road densities. Clearly, maintaining the status quo has resulted in a declining Cabinet-Yaak grizzly bear population. The Forest Service has a statutory duty to protect and recover threatened and endangered species. The Forest Service reliance on pre-amendment grizzly bear management criteria fails to meet that requirement.

D. Implementation of Alternative 1 as described in the ROD will Violate the 2001 Settlement Agreement with the Alliance for the Wild Rockies

The 2001 Settlement Agreement clearly disallows any action that is likely to adversely affect grizzly bears. If the Forest Service had taken into consideration the actual potential for adverse impacts on grizzly bears from the Young Dodge project the logical conclusion would have been that the project is Likely to Adversely Affect grizzly bears. As pointed out above, there are numerous actions associated with the selected alternative that have a high potential to adversely affect grizzly bears. Moreover, the failure to utilize the best available science when making the effects determination for the project must render the Forest Service's "Not Likely to Adversely Affect" determination for grizzly bears invalid. #41

[7] "The Selected Action includes a project-specific Forest Plan amendment to this standard allowing harvest in big game movement corridors that are further than 600 feet from suitable hiding cover." ROD App. 3 at 1.

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Response to Comment #39: Although grizzly bear movement across the Koocanusa Reservoir and open Tobacco Valley is not inconceivable and is suspected to occasionally occur, most grizzly bear movement between the CYRZ and NCDE occurs south of Libby Dam in an area of Management Situation 2 lands on the Fortine Ranger District or north of the US/Canada border. Recent telemetry data from collared grizzly bears confirms this movement. This potential linkage is acknowledged by the fact that the KNF is managing its road densities in the West Kootenai and Tobacco BORZ according to standards established for those areas in order to minimize the potential effects on dispersing grizzly bears. The analysis for BORZ begins on page III-266 of the FSEIS.

Response to Comment #40: The effects on grizzly bear and big game movement corridors is addressed on pages III-262 and III-183 (Table 3-2) respectively. Note that the post-project cover to forage ratios for non-winter cover, which facilitates movement of bears, (summer ranges MAs 12, 15, 16) remain above 85%.

Response to Comment #41: The requirements of the 2001 settlement agreement with Alliance for the Wild Rockies were met with the release of the 2004 Access Amendment. On November 9, 2011; Paul Bradford signed the Record of Decision for the Forest Plan Amendment for Motorized Access Management within the Selkirk and Cabinet-yaak Grizzly Bear Recovery Zones. This decision implements Access Management Standards across the Kootenai National Forest. Both the 2011 Access Amendment and the Young Dodge project have been consulted with USFWS. Concurrence on the Young Dodge project was received on 3/9/2012.

Comment	#	Response
V. THE FOREST SERVICE RELIES UPON AN OBSOLETE AND DESTRUCTIVE MANAGEMENT PARADIGM The DEIS states, "The desired future condition considered ecological processes, as well as social needs and desires." (I-1.) "Social needs" ought to include sustainability. This can easily be understood from the definition of **sustainability** adopted by the Montana Forest Restoration Committee in creating their Montana Forest Restoration Principles.: > The ability of any enduring social or natural system to continue functioning into the indefinite future without being forced into decline through exhaustion of key resources. In a sustainable system, the demands placed upon the environment by people and commerce can be met without reducing the capacity of the environment for future generations. Essentially, it is recognized that economic security, community vitality, equity, quality of life, and commitment to the welfare of future generations depends upon maintaining and restoring ecological integrity. (See: http://www.montanarestoration.org/restoration/principles.)	#42	**Response to Comment #42:** Social Factors are defined in the FSEIS on page I-7. These include providing an appropriate transportation system, recreation facilities, and special uses to meet the demands of the public, while protecting resource values.
The purpose and need does not prioritize ecosystem restoration. Sensitive and threatened native trout species are found in project area streams. It would only be proper that "desired future conditions" would include fully functioning streams with healthy populations of native fish. "Reference conditions are assumed to be ecologically sustainable." (DEIS at I-1.) Yes, sustainability ought to be the ultimate goal for any management, especially for national forests. Prominent conservation biologist Reed Noss (2001) discusses both "natural conditions" (synonymous with "desired conditions" or "historic range of conditions as discussed in the EIS[8]) while addressing sustainability: > One of the most useful ideas is the concept of "natural" or "historic" range of variability. This concept recognizes that natural ecosystems are always changing, but that variation over time falls within certain bounds. The species that make up an ecosystem have evolved within this range of variability. They have adapted to these conditions. > > The challenge for conservationists is not to prevent change. A sustainable relationship with a dynamic earth requires that we allow ecosystems to respond to [8] From the Analysis of the Management Situation Technical Report Glossary: **Goal** - A concise statement that describes a **desired condition** to be achieved sometime in the future. It is normally expressed in broad, general terms and is timeless in that is has no specific date by which it is to be completed. Goal statements form the principal basis from which objectives are developed. (emphasis added.) **Desired Future Condition** - A portrayal of the land or resource conditions that are expected to result if goals and objectives are fully achieved. **Historic range of variability (HRV)** - The variation in spatial, structural, compositional, and temporal characteristics of ecosystem elements as affected by minor climatic fluctuations and disturbances within the current climatic period. This range is measured during a reference period prior to intensive resource use and management. The range of historic variability is used as a baseline for comparison with current conditions to assess the degree of past change… 23	#43	**Response to Comment #43:** CEQ Implementing Regulations (§ 1500) do not require a discussion of desired future conditions. The "Analysis of Direct and Indirect Effects" section on pages III-147 through III-149 disclose that there would be no measurable effects to native fish from any of the action alternatives. The cumulative effects of the project, coupled with current and reasonably foreseeable actions, are discussed on pages III-149 through III-153 further disclose the effects of this project on native fish populations. All conclusions disclose that Young and Dodge Creeks would be fully functioning streams with healthy populations of native fish and comply with all law, regulation, and policy. This is summarized on pages III-153 through III-154.

> environmental change with minimal losses of biodiversity. That means assuring that the changes we impose on ecosystems are within the range of variability that native species have experienced over their evolutionary histories. We must keep the rates, scales, and intensities of change within the historic range of variability for those systems. Failing this (and we certainly appear to be failing, as a consequence of profligate human population growth and resource consumption) our only viable strategy is to reduce the rate, scale, and intensity of change as much as possible, …while developing land-use and land management practices that mitigate the impacts of inevitable changes.

From D.C. Carlton's forward in Noss (2001), :

> For real sustainability, the conditions, processes, abundances, and ecological interactions that can sustain all native elements of biological diversity (at safe and historically reasonable densities) would be present.
>
> …Ecological sustainability occurs when each ecosystem is fully functioning with all of its natural parts.
>
> …Achieving ecological sustainability will be complex as well as controversial. Yet, we can and must demand that the concept of ecological sustainability be incorporated in our environmental legislation, public education, and all land management decisions so that it becomes a necessary, primary, and central consideration in all questions involving development.

Carlton concludes, "There must be major changes in human and especially American, attitudes and beliefs before we will choose to heal our natural systems." The Young Dodge DSEIS fails to heed the call to make a choice to "heal our natural systems" and represent the failed management paradigm of the past.

And Carlton's "major change" must also take into account the effects of human-induced climate change, and what humans can do to offset our previous actions. The project area and KNF have been fundamentally changed, so the agency must consider how much native forest it has fundamentally altered compared to historic conditions forestwide before pursuing "treatments" here. And that includes considering the effects of human-induced climate change. Essentially, this means considering new scientific information on all kinds of changes away from "historic conditions"

In a literature review, Smith (2008a) points out "researchers currently estimate that U.S. forests offset ten percent of U.S. carbon dioxide emissions, with the potential for even more carbon sequestration." Smith (2008a) concludes:

> In light of this scientific evidence, the Forest Service's emphasis should shift from logging to carbon storage. All old-growth forest areas and previously unlogged forest areas should be preserved indefinitely for their carbon storage value. Forests that have been logged should be restored and allowed to convert to eventual old-growth condition. This type of management has the potential to double the current level of carbon storage in some regions.

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In a literature review, Simons (2008) states, "Restoration efforts aimed at the maintenance of historic ecosystem structures of the pre-settlement era would most likely reduce the resilient characteristics of ecosystems facing climate change (Millar 1999)."

Forest Service biologist Cherry (1997) states:

> The black-backed woodpecker appears to fill a niche that describes everything that foresters and fire fighters have attempted to eradicate. For about the last 50 years, disease and fire have been considered enemies of the 'healthy' forest and have been combated relatively successfully. We have recently (within the last 0 to 15 years) realized that disease and fire have their place on the landscape, but the landscape is badly out of balance with the fire suppression and **insect and disease reduction activities** (i.e. salvage logging) of the last 50 years.

Just how out of balance all the logging has caused the project area to be merely in terms of merely the snag issue (see Section I, above) has not been determined, because the data has not been gathered in the project area.

Regarding the mismanagement by this "manipulate and control" paradigm, Wuerthner (2006a) states:

> The industrial/anthropocentric perspective believes that humans can and must control processes such as fire. It also tends to believe that natural processes are mechanical and that they respond to human tinkering much like a machine. Ultimately, the industrial/anthropocentric perspective on wildfire negatively affects the health and well-being of the environment.

Wuerthner (2006a) identifies several reasons why management based upon a world view—pervasive throughout the Young Dodge DSEIS—is simply not sustainable.

Frissell and Bayles (1996) reinforce our point about land managers' hubris:

> Most philosophies and approaches for ecosystem management put forward to date are limited (perhaps doomed) by **a failure to acknowledge and rationally address the overriding problems of uncertainty and ignorance about the mechanisms by which complex ecosystems respond to human actions.** They lack humility and historical perspective about science and about our past failures in management. **They still implicitly subscribe to the scientifically discredited illusion that humans are fully in control of an ecosystemic machine and can foresee and manipulate all the possible consequences of particular actions while deliberately altering the ecosystem to produce only predictable, optimized and socially desirable outputs.** Moreover, despite our well-demonstrated inability to prescribe and forge institutional arrangements capable of successfully implementing the principles and practice of integrated ecosystem management over a sustained time frame an at sufficiently large spatial scales, would-be ecosystem managers have neglected to acknowledge and critically analyze past institutional and policy failures. They say we need ecosystem management because public opinion has changed, neglecting the obvious point that public opinion has been shaped by the

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#44

Response to Comment #44: The data source, methods, and assumptions for the snag analysis are described on page III-165 of the FSEIS. While every acre of past management has not been monitored, representative stands of past management have been monitored and served to help establish the elements of a very conservative snag analysis. Snags Table 3-1 on page III-167 of the FSEIS describes the estimated existing condition for the snag resource including the effect of past and current firewood cutting along all roads in the planning unit.

Comment	#	Response
glowing promises of past managers and by their clear and spectacular failure to deliver on such promises. (Emphasis added.) So the FS proposes to manipulate vegetation, partly in response to the notion that fire suppression and logging have thrown the ecosystem out of balance. And in an area that Section III of the appeal reveals the FS has, as Frissell and Bayles describe, "failed to deliver on such promises." The DSEIS says that a major cause of the vegetative "problems" is the FS's fire suppression regime, the outdated "Smokey Bear" paradigm which sees fire not as the rejuvenating natural process it is, but instead a threat to the ecosystem. Unfortunately, the Young Dodge project represents an agency unable to shift from such an outmoded worldview. The vegetation manipulations, when they are not simply generating capital for agency budgets, are claimed to replace natural fire with mechanical "treatments" and "prescribed" fires, without any scientific support that our ecosystems can indeed be maintained or restored by such heavy-handed actions.	#45	**Response to Comment #45:** The Young Dodge Project desired future conditions are based on the goals and objectives provided in the Forest Plan.
The existing problematic road system in the project area was put in place for one primary purpose, that being to facilitate logging. Likewise, fire suppression actions on national forest land have traditionally been done to protect the commercial timber base. So timber production and fire suppression is the root cause of the "problems" now identified in the DSEIS. Unfortunately, the agency now proposes more of the same, logging and fire suppression, to solve the problems caused by logging and fire suppression.	#46	**Response to Comment #46:** The Young Dodge project is based on the management direction in the current plan. Low elevation treatments are designed to increase the opportunities for fire fighters to safely suppress fires around the West Kootenai community and provide access and egress for firefighters, local residents, and forest users. In these areas, fire suppression is desired to protect values at risk (i.e. communities). However, it should be noted that this project does not foreclose options to suppress or not suppress fires in the future. In fact, one could argue that it could provide fire managers more options to manage fire in the future.
The DSEIS proposes inadequate solutions to problems the FS has been integral in causing, accomplishing mainly the maintenance of the social and political status quo of fire suppression and other ecosystem manipulation and degradation.	#47	**Response to Comment #47:** The FSEIS proposes treatments to accomplish the Purpose and Need for action. Part of that Purpose and Need includes the consideration of social needs.
Regarding the KNF's untested theory on restoring vegetation by logging it, obviously the implications remain for areas not "treated" under the selected alternative. If "forest health," fire, and other resource concerns are really driving the need for more logging as the KNF claims, then the failure of the DSEIS to disclose the landscape level implications for "forest health," fire, etc. over the rest of the (not to be logged) forest in the cumulative effects analysis area constitutes a severe deficiency, violating NEPA. We also made this assertion in Section I of this appeal. Based on the FS's addiction to logging as a way to "restore" the KNF, it is clear that, "the USFS appears to [be] more interested in harvesting timber than in complying with our environmental laws." See, e.g., *Earth Island v. U.S.F.S.*, Slip Op. No. 05-16776 (March 24, 2006), at 3242-43. As the Court there recognized, and as the KNF is fully willing to resemble, the FS simply not willing to go the full measure to comply with environmental laws, when to do so would get in the way of the money-train provided to the bureaucracy by timber production. The KNF colors the vast vegetation treatments proposed as some sort of benefit to reducing the "threat" of wildland fire. In fact the ROD at page 4 states, "Two key goals of the National Fire Plan are: 1) rehabilitation and restoration of landscapes, and 2) hazardous fuel reduction," which are goals of the Young Dodge Project. 26	#48	**Response to Comment #48:** The cumulative effects bounds of analysis for each resource area as well as the anticipated effects are disclosed in FSEIS/Project File.

Carefully crafted fuel reduction to protect homes would focus closely to private property boundaries, allowing more enlightened wildland fire use. Finney and Cohen, 2003, state:

> Research findings indicate that a home's characteristics and the characteristics of a home's immediate surroundings within 30 meters principally determine the potential for wildland-urban fire destruction. This area, which includes the home and its immediate surroundings, is termed the home ignition zone. The home ignition zone implies that activities to reduce the potential for wildland-urban fire destruction can address the necessary factors that determine ignitions and can be done sufficiently to reduce the likelihood of ignition. Wildland fuel reduction outside and adjacent to a home ignition zone might reduce the potential flame and firebrand exposure to the home ignition zone (i.e., within 30 m of the home). However, the factors contributing to home ignition within this zone have not been mitigated. Given a wildfire, wildland fuel management alone (i.e., outside the home ignition zone) is not sufficient nor does it substitute for mitigations within the home ignition zone. ...(I)t is questionable whether wildland fuel reduction activities are necessary and sufficient for mitigating structure loss in wildland urban fires.

In discussing the management of fuels beyond the 30 meter zone, those authors state:

> (W)ildland fuel management changes the ..., probability of a fire reaching a given location. It also changes the distribution of fire behaviors and ecological effects experienced at each location because of the way fuel treatments alter local and spatial fire behaviors (Finney 2001). **The probability that a structure burns, however, has been shown to depend exclusively on the properties of the structure and its immediate surroundings** (Cohen 2000a).

(Emphasis added.) Finney and Cohen (2003) discuss the concept of a "fireshed involving a wide area around the community (for many miles that include areas that fires can come from)." In other words, for any given entity that would apparently have its risk of fire reduced by the proposed project (or affected cumulatively from past, ongoing, or foreseeable actions on land of all ownerships within the Young Dodge project area "fireshed")—just how effective would this reduction be? The DSEIS fails to include a thorough discussion and detailed disclosures of the current fuel situation within the fireshed within and outside the proposed treatment units in order to make conclusions about the degree to which fire behavior would be changed by the project. #49

Along with spatial, the **temporal** effects were inadequately addressed. In other words, how will fuels—and thus risk—change two years post-project, and likewise 5 years, ten years, 20 years, simply due to average rainfall and expected vegetative responses? The KNF's reply is that such a topic is outside the scope of Young Dodge. However, Graham et al. (2004) state, "it cannot be emphasized enough that all fuel strata need to be managed (over time and space) to minimize the unwanted consequences of wildfires." #50

The FS does not have a detailed long-term program for maintaining the allegedly safer conditions, including how areas will be treated in the future following proposed treatments, or how areas not needing treatment now will be treated as the need arises. The public at large, and private landowners, must understand the implications of the long-term efforts, including the #51

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Response to Comment #49: See discussion on Fuels in Chapter III of the FSEIS pages III-79 – III-93. Additional information may be found in the Fuels portion of the Project File.

Response to Comment #50: Strategy 1 (page I-9) describes the need to reduce fuel accumulations. Maintenance burning is described on page II-10. Maintenance burning is used to address the temporal issue described above. In relation to past projects, returning low intensity fire to some of the ecosystems within the Young Dodge project area addresses the concerns described in Graham et al. Determining the temporal effects of this project in terms of future fuels accumulations is beyond the scope of this project. Changes to the vegetation due to natural conditions will be assessed in the future as they occur.

Response to Comment #51: Future needs will be addressed as they arise because it cannot be foreseen what activities would be needed in the future; nor is there information to indicate where they would occur. It is important to note that this project is addressing maintenance of previously treated areas (see page III-77).

amount of funding necessary, and the likelihood based on realistic funding scenarios for such a program to be funded both adequately and in a timely manner. The importance of spatial arrangement of fuel treatments was largely ignored by the KNF's desire to create its so-called "desired conditions" that mimic large-scale disturbance events of many hundreds or a few thousands of acres that created these large, even-aged forest patches. Graham et al. (2004) cite the work of Finney: Finney (2001) theoretically examined the importance of spatial pattern to the efficiency and effectiveness of treatment units in changing fire behavior at the landscape scale. Strategic area treatments (Finney 2001, Hirsch and others 2001) create landscape fuel patterns that collectively slow fire growth and modify behavior while minimizing the amount of treated area required. The arrangement of vegetation pattern changes fire behavior by forcing the fire to repeatedly flank around patches of treated fuels. Thus, the rate of growth of the fire is slowed, and its intensity and severity are reduced. The importance of spatial pattern is emphasized by findings that random fuel treatment arrangements (Finney 2003) are extremely inefficient in changing fire behavior (fig. 19)—requiring perhaps 50 to 60 percent of the area to be treated compared to 20 percent in a strategic fashion (Finney 2001). If fuel treatments are to be effective at changing the growth of large fires, then strategic placement of treatment areas must be capable of accommodating constraints on the amount and placement of fuel treatments because of land ownership, endangered species, riparian buffers, and other concerns. The costs and maintenance levels that would be needed to maintain this forest pattern are unknown but should vary depending on the forest type. Based on the work of Finney, having large areas all be regenerated to the same age is counterintuitive to breaking up fire behavior/reducing crown fires. Indeed, large-scale regeneration logging is not the same as the effects of wildfire, the latter a stochastic process that creates a mosaic effect of forest structures and ages across the landscape.	#52	**Response to Comment #52:** "Treating small or isolated stands without assessing the broader landscape will most likely be ineffective in reducing wildfire extent and severity. (from Graham et al. 2004)" The Rexford Ranger District has demonstrated the effectiveness of treating large blocks of vegetation to slow or stop the spread of wildfire; see Volume 9, Document 11 of the Project File.
There is a fundamental problem with substituting National Fire Plan strategy for Forest Plan strategies; that is, these policies have not been subjected to programmatic NEPA analysis, and without first revising the Forest Plan, the new strategies are also not subjected to the kind of NEPA analysis that would disclose and analyze the potential forest-wide impacts. Even the KNF's 1998 Fire Management Plan was not developed utilizing the NEPA process. TLC stated in its DEIS comments: The DEIS also fails to disclose the ecological and economic cumulative impacts of its fire suppression management regime. The Forest Service has never complied with NEPA by analyzing and disclosing economic and ecological cumulative effects of the KNF's fire suppression. The KNF's response: "This issue is beyond the scope of this project." Well, we continue to wonder what public process is the cumulative effects of fire suppression within the scope of? 28	#53	**Response to Comment #53:** The Young Dodge project is based on the management direction in the current plan. Although the National Fire Plan provides some additional information on managing wildland fire and fuels, it does not and has not been substituted for the Forest Plan. In general, the National Fire Plan and Forest Plan are not in conflict. The cumulative effects of not doing this project are addressed in Alternative 2, the No Action Alternative.

VI. OLD GROWTH AND OLD GROWTH MANAGEMENT INDICATOR SPECIES

The FS is has still not developed a scientifically sound strategy for old-growth associated wildlife species viability in a properly-defined cumulative effects analysis area. Committing vast areas of the KNF to logging continues to threaten species associated with old-growth conditions. #54

In the total absence of population monitoring information, the ROD's decision to log ***any*** old growth, or ***any*** forest that provides habitat for old-growth wildlife species is arbitrary and capricious. The DSEIS indicates the project "May impact …" species that rely on areas of old growth for their existence. The FS has not shown its logging of old growth on the KNF has ever result in the old growth still meeting the applicable old-growth criteria nor has the FS done wildlife surveys in such areas to show that the species that would allegedly benefit really do. There is no demonstrated tendency of any logged stands to maintain or develop into actual old growth in any given time frame.

A. Species Monitoring

In the June 27, 2003 Order, the U.S. District Court stated, regarding the several timber sales on the KNF, "The Forest Service is out of compliance with the Forest Plan …in monitoring requirements for pileated woodpeckers." That situation continues to date.

The pileated woodpecker is the management indicator species (MIS) for old growth as designated by the Kootenai Forest Plan, and as such, the Forest Service believes maintaining populations of this bird on the KNF would also provide for other old growth wildlife species. The Young Dodge timber sale would adversely affect pileated woodpecker habitat and thus, increase the risks to population viability of that species and others associated with old-growth habitat. #55

Using the pileated woodpecker to "indicate" for other old growth species is not consistent with the best available science. *Idaho Sporting Congress v. Rittenhouse* [F.3d ____ (9th Cir., 2002)] is instructive: #56

> We must also add to the list of factors preventing us from accepting the Forest Service methodology in this case as reasonably ensuring populations of old growth species, the conclusion of the Forest Service's wildlife expert… that "[a]lthough old growth habitat and pileated woodpecker habitat are often assumed to be one and the same, the two may or may not overlap depending upon stand characteristics." Based on this and other factors, the expert concluded that "it is necessary to assess pileated habitat independent of any old growth analysis…"

Ibid. at 14180. This is equally the case for the KNF, which also chose the pileated woodpecker as an indicator species for all the old-growth species on the forest. The pileated woodpecker is very adaptable to varying forest conditions. Indeed, an expert for the KNF recognized as far back as March of 1997 that:

> "landbird monitoring results for the Northern Region showed pileated woodpeckers present to varying degrees in all vegetation types sampled except agricultural and residential… [Pileateds] are relatively common in both uncut and cut mid-elevation

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Response to Comment #54: The analysis for old growth resources begins on page III-155 of the FSEIS. Together with the analysis for snag / down wood resources; and pileated woodpeckers, species associated with old growth and its elements are thoroughly addressed. Portions of the analysis include the effects of roads on interior habitats, snags, as well as the edge effects of existing units on old growth. This analysis acknowledges that species use and or presence could change as a result of thinning or prescribed burning in old growth (III-159-161). Alternative 3 was developed to address these concerns. For Young Dodge, specific areas were avoided in order to maintain connectivity between existing old growth (MA13) areas, especially along riparian environments, even though they do not contribute to designated (MA13) old growth.

Response to Comment #55: The effects analysis for the pileated woodpecker is included in the FSEIS pages III-188-194.

Response to Comment #56: While the pileated woodpecker may not fully address the habitat needs for all old growth associated species, it certainly addresses many of the resource elements typically found in old growth and mature forests. The pileated woodpecker will continue to serve as the MIS for old growth species as long as the 1987 KNF Forest Plan remains in effect.

conifer forests… The species appears to do well in a matrix of forest types…" (KNF Plan Monitoring Report FY 1996, p. 16.)

The KNF now acknowledges that the needs of old-growth species are not adequately represented by the pileated woodpecker, due to its disproportionate reliance upon snag habitat, while other old-growth species depend more on *live* tree and *multiple canopy* aspects of older forests (i.e., uncut habitat). Indeed, the author of the 1979 paper the KNF used to justify reliance on the pileated woodpecker as its sole MIS for old growth dependent species has recognized that:

> Using the pileated woodpecker as a management indicator for old growth has been questioned because of concerns about excessive reliance on a single species and because pileated woodpeckers often forage in younger forest stands. (McClelland and McClelland, 1999; internal citations omitted.)

#57

Utilization of the Forest Plan's 10% old-growth Standard itself is not consistent with the best available science. Lesica (1996) stated that the Northern Region of the FS's general goal of maintaining 10% of forests as old growth may extirpate some species. This is based on his estimate that 20-50% of low and many mid-elevation forests were in old growth condition prior to European settlement. The Kootenai National Forest's own analysis (Gautreaux, 1999) reveals 10% to be, quite realistically, not within the historical range. The DSEIS cannot even provide an estimate of how much old growth in the project area has been destroyed by logging.

#58

#59

TLC's DEIS comments stated:

> The DEIS fails to provide an estimate of how much old growth in the project area has been destroyed by logging, and what the historic range was for "reference conditions." The DEIS fails to disclose information from a document it cites for other purposes (Gautreaux, 1999) which indicates that 22% old growth is at the lower limit for "reference conditions" on the KNF. So utilization of the Forest Plan's 10% old-growth Standard itself is not consistent with the best available science on "reference conditions."

The FS responded, "CEQ Implementing Regulations (§1500) do not state the requirement for a discussion of "reference conditions" for any resource. Additionally, Forest Plan standards are outside the scope of this site-specific project."

Interesting, isn't it, that the KNF claims that "Forest Plan standards are outside the scope of this site-specific project" at the same time as the ROD **amends Forest Plan standards** to allow more logging?

So why does the KNF still maintain that assume that less than half that 22% historic minimum[9]—10%—is all that is needed to maintain viable populations of old-growth species? The scientific basis for the KNF's position, namely that maintaining 10% old-growth on the Forest is plenty to maintain population viability of all species needing old-growth habitat, is completely lacking.

[9] Also considering the KNF old growth's currently fragmented condition.

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Response to Comment #57: While the pileated woodpecker may not fully address the habitat needs for all old growth associated species, it certainly addresses many of the resource elements typically found in old growth and mature forests. The pileated woodpecker will continue to serve as the MIS for old growth species as long as the 1987 KNF Forest Plan remains in effect.

Response to Comment #58: The KNF Forest Plan determined that maintaining old-growth levels of ten percent below 5500 feet was sufficient to support old growth species (Forest Plan Appendix 17 and the Forest Plan EIS). These documents discuss the various characteristics of old-growth dependent species and their habitat, citing numerous scientific studies. The Lesica study was published after the Forest Plan. However, it does not provide any information to indicate that 10% old growth is not enough to provide for viable species.

Response to Comment #59: Old Growth Table 3-2 on page III-158 displays the estimated reference conditions for old growth based on VRUs in the Young Dodge planning unit. It also displays the existing condition for old growth (designated and undesignated) by VRU. How much old growth actually existed on the ground, exposed to natural events and native people's manipulation, prior to European settlement and subsequent logging, is purely speculative. The best information the KNF can provide can be found in Appendix 5, which is a log of past actions by forest stand. However, these stands may or may not have contributed to, what is now referred to as, old growth.

#60 Since there is no scientific proof that 10% old growth is enough for species viability, and since there is no scientific basis to support the KNF's use of the pileated woodpecker as adequately "indicating" for other species, the proof would be in the monitoring. And nothing in the DSEIS shows the FS has completed or is committed to the monitoring that would help insure old-growth species' viability.

Response to Comment #60: The KNF Forest Plan determined that maintaining old-growth levels of ten percent below 5500 feet was sufficient to support old growth species (Forest Plan Appendix 17 ad the Forest Plan EIS). These documents discuss the various characteristics of old-growth dependant species and their habitat, citing numerous scientific studies. The amount and types of old growth are tracked at the Forest level and require Forest Supervisor approval for changes. Any available field data from planning unit surveys (e.g. goshawk, flammulated owls, bird point-count surveys) will continue to be used to assist in the viability analysis for old growth associated species until new direction becomes available. The 2007 Monitoring Report includes monitoring for the winter wren and brown creeper because they are more strongly associated with old growth forest stands. The monitoring report found that pileated woodpeckers are widespread and are relatively common on the Forest and that information is similar for the Region is similar for the pileated woodpecker as well as the other two species.

B. The Forest Service has not showed it has maintained 10% effective old growth on the KNF

In the District Court's June 27, 2003 Order, the judge also stated: "The Forest Service is out of compliance with the Forest Plan in the amount of old growth across the Forest…" and "the amount of old growth on the forest … is a matter for the agency to reconsider in the light of its full inventory of the forest and the opportunity for public comment."

The FS first publicized what it believes is its first full inventory of old growth on the KNF, on its website starting July 17, 2003, initiating the public's opportunity to review and comment on the inventory[10]. We note that the only response to those comments we've received was in the context of recently completed litigation on the KNF's old-growth situation, which indicates the FS doesn't really believe the comments are relevant to the public.

Following initiation of litigation, the FS now alleges that that presently over 10% of the KNF below 5,500 feet elevation is in old-growth forest condition. Only in response to litigation did the KNF manufacture figures that allege to show that there is 10% old growth on the Forest. The available information is still not adequate proof that there is 10% ***effective*** old growth on the Kootenai National Forest.

The FS's Leavell Report shows the author's best estimate of old-growth acres on the KNF below 5,500 feet elevation is 9.737%. This 9.737% figure clearly raises serious questions concerning the scientific validity of the KNF's other forestwide inventory data. Nothing presented to date eliminates the lingering questions over the reliability of the FS's KNF old-growth inventory data.

The FIA old-growth data cited in the Leavell Report does not provide any information on the block size of old-growth areas that make up the estimated 9.737%. This is important since the Forest Plan recognizes that 50 acres is the minimum size for old growth to be considered effective habitat.

#61 The FS has not surveyed with adequate detail all of the designated old growth, and the DSEIS does not specifically address the potential problems with the data. The FS has not clearly explained, in plain language, what methods have been used to survey and to designate each stand as old growth—forestwide as well as in the project area. This perpetuates our longstanding concerns over the reliability of data that have historically dogged the KNF's old-growth estimates.

[10] As of the date of this appeal, that information is not available on any readily accessible link on the KNF's website.

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Response to Comment #61: The KNF revisited its old growth status and completed that review as directed by court in 2004 using the best information available at that time. The findings of that review are available at the KNF Supervisor's Office in Libby, Montana. A summary of the existing old growth conditions for the KNF and Young Dodge Planning Unit is given on page III-157 of the FSEIS. The amount and types of old growth (designated, undesignated, effective, replacement) are tracked at the Forest level and require Forest Supervisor approval for changes.

Logging forest that is anything close to old growth condition is reckless, when the amount of effective old growth on the forest is dangerously close to being below, or is already below, 10% forestwide.

Naficy, 2005 documents his GIS analysis of old-growth blocks in relation to Forest Plan compliance with the KNF requirement to maintain a minimum of 10 percent old growth across the KNF. He concludes that:

> Looking across both analyses at the 100 acre block analysis level, which was recommended as the "general rule" in the KNF's Forest Plan, it is clear that the KNF remains on the edge of the old growth requirements at best and at worst is significantly below the required level if only verified effective old growth is included in the acreage calculations.
>
> If unknown old growth is removed from the calculations, only the 50 acre block analyses designed primarily for pileated woodpeckers meets the 10 percent requirement. The KNF does not, however, meet the 10 percent requirement of effective old growth if analyzing the known effective old growth at the 80 acre or 100 acre block size.

Following previous presentation of this data and analysis, the KNF has pretty much ignored it, not putting it in any context of "best available scientific information" as the agency claimed to adopt as its viability standard.

And due to the results of past logging and recent wildfires, old-growth habitat is poorly distributed across the Forest. However, the KNF has failed to disclose the implications of this poorly distributed habitat on population trends and population viability of the various old-growth associated wildlife species.

The FS has not firmly established the objective physical criteria that KNF forest stands must meet for designation as effective old growth, saying different things in different places. Nor is there any objective criteria for "replacement" old growth[11], or any indication of the time frame necessary before these stands can meet the needs of species of concern. In other words, there is no cogent strategy for conserving this habitat and ensuring species viability.

The FS also relies upon a database (TSMRS) of timber stand examination information documented by stand examiners who are not necessarily wildlife biologists. This has led to inaccurate designations of old growth, as well as invalid assumptions by biologists doing habitat analyses for timber sales. The FS does not reconcile its use of timber stand database for wildlife habitat analyses and the fact that they have discredited such use:

> Habitat modeling based on the timber stand database has its limitations: the data are, on average, 15 years old; canopy closure estimates are inaccurate; and data do

[11] Scientifically objective criteria include those that could be utilized by independent trained surveyors using the same methodology to reach the same conclusions about a given stand's old-growth character. That would address the reliability/consistency issue as explained by Hack (2000).

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#62

Response to Comment #62: The KNF completed a forest-wide coverage in GIS for old-growth revalidation in 2003 in response to a 2002 lawsuit and submitted the analysis and results to the District Court of Montana. The KNF has demonstrated that it meets the 10 percent old growth standard as directed by its Forest Plan. More information is available at the KNF Supervisor's Office in Libby, Montana.

#63

Response to Comment #63 Old Growth standards can be found in the Kootenai National Forest Plan.

#64

Response to Comment #64 The KNF revisited its old growth status and completed that review as directed by court in 2004 using the best information available at that time. The findings of that review are available at the KNF Supervisor's Office in Libby, Montana. A summary of the existing old growth conditions for the KNF and Young Dodge Planning Unit is given on page III-157 of the FSEIS. The amount and types of old growth (designated, undesignated, effective, replacement) are tracked at the Forest level and require Forest Supervisor approval for changes. Again, available field data from planning unit surveys (e.g. goshawk, flammulated owls, bird point-count surveys) are used by biologist(s) to assist in the viability analysis for old growth associated species until new direction becomes available.

> not exist for the abundance or distribution of snags or down woody material… . (USDA Forest Service, 2000c.)

The DSEIS also continues to rely on wildlife habitat models for TES and MIS, of unproven reliability. The KNF cites the results of no on-the-ground studies verifying the assumptions inherent with the use of the habitat models employed by the DSEIS's analyses. Mander (1991) notes criticisms of the use of computers by the FS biologists, and discusses the loss of relationship between humans and their wildlife neighbors as such computer models are utilized by biologists, in substitute for actually doing on-the-ground species habitat assessments and species presence monitoring.

The KNF relies upon "replacement old growth" for the purposes of meeting Forest Plan standards, but without ever determining nor disclosing the suitability of such habitat for old-growth wildlife species. The DSEIS also fails to disclose how many acres of what the FS considers "replacement old growth" would be logged under any action alternative. Apparently the KNF only wants to disclose amounts of "replacement" old growth in the context of making up for deficiencies in meeting its 10% Compartment minimums.

The FS never carried out the NFMA-mandated program of monitoring species' populations to validate its assumptions, including the assumption that 10% effective old-growth habitat will, in fact, insure the viability of all old-growth dependent species, as well as the designation of replacement old growth to satisfy species' needs, the distribution methodology, the old-growth criteria, the discounting of areas above 5,500' elevation as contributing to species' viability, etc. Of significant concern is the recognition by the FS, during development of the Forest Plan, that a margin of safety is required to prevent falling below minimum levels due to natural disturbances. The FS has not explained how the small margin beyond 10% of actually designated old growth is adequate to insure that the KNF will not drop below 10% forestwide. The FS has not disclosed how many acres that margin of safety is, in relation to how many old-growth acres could be expected to be lost from a significant wildfire event. In litigation, the FS explained that a 25% margin had been considered adequate when the KNF Forest Plan was adopted, but no information now available indicates the KNF has this margin. For viability to be insured, the FS must maintain sufficient habitat for decades to come on the KNF.

There is no information on how much has been logged or lost due to road building, land exchange, wildland fire, poorly implemented dry-site old growth "restoration treatments", or simple forest succession during Forest Plan implementation. There is no discussion as to the impacts of this cumulative loss of old growth on wildlife species. As alluded to above, there is no disclosure on how much effective old growth is expected to be lost in the future due to these effects.

Schloeder, 2001a and 2001b are reports on investigations of the old-growth habitat in timber compartments located on the Rexford RD. These reports, a scientific analysis of the FS's own information, reveals that the old-growth habitat in those areas is notably deficient in terms of meeting the KNF and Forest Plan requirements for total amount, distribution, quality, and block size. The FS's methodology is inadequate to demonstrate that "designated effective" old growth on the KNF is meeting old-growth wildlife species' viability needs. Simply put, the FS cannot

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#67

Response to Comment #65: While the models themselves are unpublished, the scientific documents used to establish the habitat parameters for the models have been peer reviewed. Additionally, the results of these models are used in conjunction with conditions found on the ground during various analyses. If and when inaccuracies are found during field reviews for a given stand, this information documented in meeting notes for the proposed project which is part of the official project file.

Response to Comment #66: Effects of the proposed alternatives on old growth are disclosed starting on page III-155 of the FSEIS. As shown in Table 3-3 (page III-159), both Alternatives 1 and 1M would thin the ladder fuels in undesignated effective old growth on approximately 221 acres. Alternative 3 does not propose to thin in any old growth regardless of the designation. All action alternatives proposed to prescribe burn (Unit 46) in approximately 83 acres of designated replacement old growth for grizzly bear foraging. Other effects to old growth area also displayed in Old Growth Table 3-3 on page III-159 of the FSEIS.

Response to Comment #67: The potential effects of future wildfires on existing old growth can only be surmised. Potential effects on old growth from future road building would be estimated at zero because there are no future plans to continue road building in this area. The future effect on old growth from potential "edge effects" from existing and proposed treatment units is displayed in Old Growth Table 3-3 on page III-159 of the FSEIS.

demonstrate that the old growth it has designated meets Forest Plan requirements and is meeting old-growth MIS needs. These reports, also indicate there is no basis for any claims to the effect that viable populations of old growth species are being maintained on the KNF. In sum, there remain a lot of serious questions and substantial doubt as to the issue of existing old-growth habitat in the KNF, as well as anticipated levels in the near future. Accordingly, it is imperative that old-growth wildlife species population monitoring be implemented now and into the next planning cycle. The best way to assure the public that old-growth wildlife species' viability is being insured, and has not been irreparably damaged by implementation of the current Forest Plan, is to simply tell the public what viable populations for species of concern are (as NFMA requires), and how that compares to existing populations. The proxy-on-proxy approach has failed to adequately address these concerns, after more than 20 years of habitat inventory. These issues must be addressed and all questions answered honestly and fully. Only then, with sufficiently complete information, can the public have a truly meaningful opportunity to participate the management decisions regarding the KNF.		
C. Old growth habitat amount and distribution in the Young Dodge Project Area does not comply with NFMA and Forest Plan The KNF has repeatedly told the public (and recently, the federal court) that meeting its old-growth species viability requirement as per NFMA is done on the Forest by designating 10% in each Compartment. The DSEIS does not provide a breakdown of the current old growth conditions and amount by Compartment, which is inconsistent with how the KNF promised the public it would do analyses to demonstrate consistency with the Forest Plan and NFMA.	#68	Response to Comment #68: Old growth was broken down by Compartment and is available in the official Project File at Volume 5, Document 00015. Analysis displaying old growth by the planning unit was chosen since per advice from the Forest Biologist at the time (4/13/2007). "The planning sub-unit boundaries do follow "major" drainage which is allowed in the FP per the word "or." Compartments are timber compartments and most do not cover complete drainage at least not "major drainage" this issue was resolved several years ago as forest direction... districts could ALSO include compartment number if they choose to." This wording is available in the KNF Forest Plan, Volume 2, Appendix A, page 17-9. The planning subunit was chosen as the analysis boundary to remain consistent with other analyses on the KNF.
D. KNF compliance with Forest Plan old-growth/open road standards The DSEIS does not discuss the project's compliance with the MA 13 Standard that requires that "Local roads will be restricted to prevent premature cutting of the snag component" (Forest Plan at III-56) and other MA-specific standards. The issue of protection of snags in old growth was an issue that was raised during the original Forest Planning public process, and the KNF promised it would take proactive steps to protect these important old-growth habitat components; however the KNF has failed to do so. The DSEIS also fails to disclose the significance of the effects on old-growth species' populations of habitat degradation of old growth because of firewood cutting and illegal poaching of trees due to unrestricted access. The DSEIS simply does not present a sufficient analysis of the impacts of roads through old growth.	#69 #70	Response to Comment #69: The Young Dodge project does not propose any new road building that could have negative impacts on the snag component of old growth. Nor does the project propose public access on any currently restricted roads. Some open roads are existent in old growth areas and the potential loss due to firewood cutting was accounted for as part of the snag analysis on page III-165 of the FSEIS. Response to Comment #70: Some open roads are existent in old growth areas and the potential loss due to firewood cutting was accounted for as part of the snag analysis on page III-165-167 of the FSEIS. The effect of road edge from all alternatives is displayed in Snags Table 3-2 on page III-167 of the FSEIS.
E. Failure to implement scientifically defensible conservation strategies for Sensitive species and old growth MIS. In response to NFMA's viability provisions, the Forest Service Manual outlines the need to design and implement conservation strategies for Sensitive and other species for which viability is a concern. The Forest Service Manual at FSM 2621.2 states: To preclude trends toward endangerment that would result in the need for Federal listing, units must develop conservation strategies for those sensitive species whose continued existence may be negatively affected by the forest plan or a proposed project. 34		

#71 Since the FS is not meeting species viability requirements as discussed above, it is critical for the FS to take steps to develop a multiple species conservation strategy for the KNF.

In regards to logging old growth:

> (T)here is the question of the appropriateness of management manipulation of old-growth stands… Opinions of well-qualified experts vary in this regard. As long term results from active management lie in the future – likely quite far in the future – considering such manipulation as appropriate and relatively certain to yield anticipated results is an informed guess at best and, therefore, encompasses some unknown level of risk. **In other words, producing "old-growth" habitat through active management is an untested hypothesis.**

(Pfister et al., 2000, pp. 11, 15 emphasis added.)

Juday (1978) discusses in detail how the protection of old-growth forests greatly sustains the many uses of our national forests, as mandated by the Multiple Use-Sustained Yield Act and the National Forest Management Act. Juday (1978) was cited by the Kootenai National Forest during original Forest Plan development, but since then the KNF has tried to sweep that expert's opinion under a rug.

#72 It is scientifically certain that the largest trees are the most fire-resistant and provide the most canopy closure and therefore cooling shade that moderates the effects of fire. In contrast, smaller trees are recognized as a more legitimate fuel concern. The DSEIS contains no diameter limit on the trees to be cut, revealing the FS's timber cutting agenda.

An example of a regional multi-species conservation strategy came about in the 1990s when in Region 6, the eastside forest plans were amended in 1994 with the "eastside screens" and the Interior Columbia Basin Ecosystem Management Project (ICBEMP) found that large old trees were below historic levels across the Columbia Basin and should be protected. The "eastside screens" Amendments were in response to scientific information that the forest plans were inadequate to assure population viability of old-growth and other wildlife species. These "eastside screens" limited logging to trees less than 21" diameter at breast height (dbh), except in rare circumstances.

#73 For single species such as the goshawk, there are strategies for the Southwest U.S. (Reynolds et al., 1992 and Crocker-Bedford, 1990), the Utah strategy (Graham et al., 1999), strategies for Alaska (Suring et al., 1993) and the Black Hills National Forest (USDA Forest Service, 2000b). The Northern Region's guidance, USDA Forest Service (1990), could have gotten the FS moving in the right direction, however the agency ignores what that document recommends for a goshawk conservation strategy on the KNF.

#74 The DSEIS claims Samson demonstrates viability for several wildlife species, yet fails to disclose the document has not been peer-reviewed nor validated for use in timber sale NEPA analyses such as this one.

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Response to Comment #71: There is no indication that the forest is not meeting its NFMA requirements for old growth dependant species (Forest Plan Monitoring Report 2007, Monitoring Item C-4).

Response to Comment #72: Diameter limits were not included in the FSEIS because in many cases they could prevent the attainment of the Purpose and Need , as follows:

1. Diameter limits preclude the removal of large trees that infected with insects or disease.
2. Diameter limits curtail the ability to develop a desired species composition or stand density. I.E. Basal areas of over 150 ft²/acre of large diameter Douglas-fir are at a high risk for an epidemic Douglas-fir beetle attack.
3. Engelmann spruce and subalpine fire remain highly susceptible to fire, even when they attain large diameters. Additionally, large subalpine fir and Engelmann spruce often have crowns that extend almost to ground level. During the Lydia and Stone Hill fires in 2000 large diameter western larch (40-60" DBH), our most fire-resistant trees, were killed because of their close proximity to large Engelmann spruce and Subalpine fire. Normally western larch this size can withstand any ground fire, but the adjacent large diameter Engelmann spruce and subalpine fir had that crowns carried the fire into the crown of the large western larch. (Personal observation by silviculturalist Joe Lewicki during the fire severity mapping of the Lydia and Stonehill fires.)

Response to Comment #73: The KNF is aware of these documents as additional direction for the management of goshawk habitat. Newer science (Brewer etal 2009) was used that indicates that goshawks use a more wide variety of habitat types and ages than previously thought.

Response to Comment #74: The Samson document is clearly defined under its methods and background section as a "conservation assessment" that " includes the peer-reviewed, non-peer reviewed publications, particularly unpublished master's thesis and PhD dissertations, research reports, and data accumulated by the Forest Service. Where possible, the peer-reviewed professional society literature is emphasized in that it is the accepted standard in science." Disclosure of this documents validation or non-validation is demonstrated by its incorporation into the bibliography for the Young Dodge FSEIS.

The Idaho Panhandle National Forests' Forest Plan provides an example of better management directives for the pileated woodpecker. Wildlife Standard #10f requires "One or more old-growth stands per old-growth unit should be 300 acres or larger. Preference should be given to a contiguous stand; however, the stand may be subdivided into stands of 100 acres or larger if stands are within one mile. The remaining old-growth management stands should be at least 25 acres in size. Preferred size is 80 plus acres." IPNF Forest Plan at II-29. This and other IPNF old growth Standards are based upon what the IPNF recognizes are pileated woodpecker habitat needs:

> To retain a viable population of pileated woodpeckers on the IPNF … our recommendations are:
> 1. Retain 10 percent old-growth throughout the Forests.
> 2. Distribute the old-growth so that old-growth compartments with 5 percent old-growth retain at least 5 percent old-growth. All old-growth stands 25 acres should be retained in old-growth compartments containing less than 5 percent old-growth.
> 3. In each 10,000 acre unit at least 300 acres should be managed specifically for pileated woodpeckers. To maximize benefits to other species as well as pileateds the 300 acres should be either contiguous or divided into subunits no smaller than 100 acres. The subunits should be within approximately two square miles.
> 4. The areas managed for pileated woodpeckers should be at least 200 yards wide.
> 5. Areas selected for old-growth management for pileated woodpeckers should also be close to water. Old-growth larch stands are highly recommended for pileated woodpecker management.

IPNF Forest Plan EIS Appendix 27 at p. II-40.

Also, "To provide suitable pileated woodpecker habitat, strips should be at least 300 feet in width …" (USDA Forest Service, 1990).

#75 The DSEIS also ignores many structural habitat components necessary for the pileated woodpecker. USDA Forest Service, 1990 indicates measurements of the following variables are necessary to determine quality and suitability of pileated woodpecker habitat:

- Canopy cover in nesting stands
- Canopy cover in feeding stands
- Number of potential nesting trees >20" dbh per acre
- Number of potential nesting trees >30" dbh per acre
- Average DBH of potential nest trees larger than 20" dbh
- Number of potential feeding sites per acre
- Average diameter of potential feeding sites

#76 This preferred diameter of nesting trees for the pileated woodpecker recognized by R-1 is notable. McClelland and McClelland (1999) found similar results in their study in northwest Montana, with the average nest tree being 73 cm. (almost 29") dbh. The pileated woodpecker's strong preference for trees of rather large diameter is not adequately considered in the DSEIS. Effectively, the DSEIS provides absolutely no commitments for leaving specific numbers and

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Response to Comment #75: The analysis for the pileated woodpecker begins on page III-188 of the FSEIS. Although much of the habitat needs of this species is incorporated by reference, the pileated woodpecker's association with forest stands comprised of old growth characteristics is clearly evident and discussed throughout the analysis including the second paragraph on page III-188.

Response to Comment #76: Please see response #75. Table 2-9 on page II-34 of the FSEIS, displays the design criteria and management requirements for snag retention and protection of cavity habitat for the Young Dodge FSEIS.

sizes of largest trees favored by so many wildlife species, resorting instead to vague statements in descriptions of the various silvicultural treatments proposed.

B.R. McClelland has extensively studied the pileated woodpecker habitat needs. To quote a March 12, 1985 letter from B.R. McClelland to Flathead NF Supervisor Edgar B. Brannon:

> Co-workers and I now have a record of more than 90 active pileated woodpecker nests and roosts, …the mean dbh of these trees is 30 inches… A few nests are in trees 20 inches or even smaller, but the minimum cannot be considered suitable in the long-term. Our only 2 samples of pileateds nesting in trees < 20 inches dbh ended in nest failure… At the current time there are many 20 inch or smaller larch, yet few pileateds selected them. Pileateds select old/old growth because old/old growth provides habitat with a higher probability of successful nesting and long term survival. They are "programmed" to make that choice after centuries of evolving with old growth.

McClelland (1977), states:

> (The Pileated Woodpecker) is the most sensitive hole nester since it requires old growth larch, ponderosa pine, or black cottonwood for successful nesting. The Pileated can be considered as key to the welfare of most hole-nesting species. If suitable habitat for its perpetuation is provided, most other hole-nesting species will be accommodated.
>
> Pileated Woodpeckers use nest trees with the largest dbh: mean 32.5 inches;
>
> Pileated Woodpeckers use the tallest nest trees: mean 94.6 feet;
>
> The nest tree search image of the Pileated Woodpecker is a western larch, ponderosa pine, or black cottonwood snag with a broken top (status 2), greater than 24 inches dbh, taller than 60 feet (usually much taller), with bark missing on at least the upper half of the snag, heartwood substantially affected by Fomes laracis or Fomes pini decay, and within an old-growth stand with a basal area of at least 100 sq feet/acre, composed of large dbh classes.
>
> A cluster analysis based on a nine-dimensional ordination of nest tree traits and habitat traits revealed close association between Yellow-bellied Sapsuckers, Mountain Chickadees, and Red-breasted Nuthatches. These three species plus the Pileated Woodpecker and Hairy Woodpecker are relatively grouped by coincident occurrence in old growth. Tree Swallows, Black-capped Chickadees, and Common Flickers are separated from the above five species by their preference for more open areas and their frequent use of small dbh nest trees.
>
> (Most) species found optimum nesting habitat in stands with a major component of old growth, particularly larch. Mean basal area for pileated woodpecker nest sites was 150 square feet per acre. (McClelland. B.R. and others, 1979)

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Many large snags are being cut for firewood. Forest managers should limit firewood cutting to snags less than 15 inches in d.b.h. and discourage use of larch, ponderosa pine, and black cottonwood. Closure of logging roads may be necessary to save high-value snags. Logging slash can be made available for wood gatherers. The FS has stated: "Well distributed habitat is the amount and location of required habitat which assure that individuals from demes, distributed throughout the population's existing range, can interact. Habitat should be located so that genetic exchange among all demes is possible." (Mealey, 1983.) That document also provides guidance as to how habitat for the pileated woodpecker must be distributed for populations to persist. For the fisher, scientific bases for conservation strategies are found in Witmer, et al., 1998, Jones (undated), and even in the KNF's own Johnsen, 1996. A multi-species approach for forest carnivores is illustrated in Ruggiero, et al., 1994. For the pine marten, USDA Forest Service (1990), Ruggiero, et al. (1998) and Bull and Blumton, 1999 form some basis for marten conservation strategies. **F. Cumulative effects on old growth and old-growth species** The FS's Logan Creek Ecosystem Restoration Project Final EIS[12] at page 3-199 states: Across the Interior Columbia River Basin (Quigley, et al. 1996), old forests have declined by 27 to 60 percent over that past 100 years and large residual trees and snags have decreased by 20 percent. Fire exclusion and timber harvest have altered the structure and composition of forests throughout the Basin, resulting in a 60 percent increase in susceptibility to insects, disease, and stand-replacing fires. These changes have contributed to declining habitat conditions for numerous species of wildlife associated with old growth forests. The Forest Plan's reliance on Thomas et al., 1979 was severely criticized in Bull et al. 1997. The FS continues to ignore this scientific information that seriously calls into question the KNF snag standards and guidelines. The DSEIS fails to disclose data from project area surveys for snags and replacements in old logging units. The DSEIS fails to disclose how many of the old logging units in the Project Area are deficient in snags, which are a vital and necessary component of old-growth species' habitat. The Rexford Ranger District's Lower Big Creek DEIS (Kootenai National Forest, 2004, p. III-123) admits that over the KNF as a whole, many areas are deficient. The Forest Plan Standard for cavity habitat states, "Specific Forest Guidelines exist and will be applied for … Cavity habitat and dependent species (Appendix 16)." Forest Plan Appendix 16 states: Minimum levels for cavity habitat retention should be applied on a drainage or compartment area basis at the following recommended levels: at least 40% of the [12] That FEIS is included in the References cited portion of this appeal as "USDA Forest Service, 2004a" 38	#77	**Response to Comment #77:** The data source, methods, and assumptions for the snag analysis are described on page III-165 of the FSEIS. While every acre of past management has not been monitored, representative stands of past management have been and serve to help establish the elements of a very conservative snag analysis. Snag Table 3-1 on page III-167of the FSEIS describes the estimated existing condition for the snag resource including the effect of past and current firewood cutting along all roads in the planning unit.

> potential capacity will be maintained throughout commercial forest lands and at least 60% of the potential will be maintained in riparian areas.

The DSEIS fails to disclose the consistency of project area Compartments with this Forest Plan established minimum, further obfuscating the old-growth species' habitat distribution question. #78

The paltry number of snags to be retained in logging units, and the failure to specify snags of adequate size, contrasts with scientifically-determined habitat needs acknowledged elsewhere by the FS. The DSEIS also cites the Northern Region Snag Management Protocol, which lacks peer-review and validation from post-implementation monitoring. Harris (1999) and ICBEMP DSEIS Appendix 12 also present scientific information that notably contrasts with the DSEIS on this topic.

The DSEIS does not adequately consider that snags may be cut down for safety reasons during logging operations (due to OSHA regulations. The DSEIS fails to disclose how much snag loss would be expected because of safety concerns and also skyline corridors and other methods of log removal—the loss could be more significant that disclosed, because the DSEIS doesn't provide any idea the degree of snag loss due to these concerns. #79

Lehmkuhl, et al. (1991) state:

> Competition between interior and edge species may occur when edge species that colonize the early successional habitats and forest edges created by logging (Anderson 1979; Askins and others 1987; Lehmkuhl and others, this volume; Rosenberg and Raphael 1986) also use the interior of remaining forest (Kendeigh 1944, Reese and Ratti 1988, Wilcove and others 1986, Yahner 1989). Competition may ultimately reduce the viability of interior species' populations.
>
> Microclimatic changes along patch edges alter the conditions for interior plant and animal species and usually result in drier conditions with more available light (Bond 1957, Harris 1984, Ranney and others 1981).
>
> Fragmentation also breaks the population into small subunits, each with dynamics different from the original contiguous population and each with a greater chance than the whole of local extinction from stochastic factors. Such fragmented populations are metapopulations, in which the subunits are interconnected through patterns of gene flow, extinction, and recolonization (Gill 1978, Lande and Barrowclough 1987, Levins 1970).

The FS has still not sufficiently dealt with the issue of fragmentation, road effects, and past logging on old-growth species' habitat. The KNF has failed to analyze or disclose the level of management-induced edge effects on old growth species' habitat forestwide, and how much total edge effect would be increased, by KNF-approved activities in the project area compartments. Fragmentation has reduced the ability to provide for the habitat needs of old-growth associated species for decades to come following implementation of the various timber sale and other activities in the cumulative effects analysis area. The KNF's 2007 Trego DN at Appendix 5-

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Response to Comment #78: Old growth was broken down by Compartment and is available in the official Project File at Volume 5, Document 00015. Per advise from the Forest Biologist at the time (4/13/2007) of the analysis displaying old growth by the planning unit was chosen since according to the Forest Biologist, "The planning sub-unit boundaries do follow "major" drainage which is allowed in the FP per the word "or" compartment are timber compartments and most do not cover complete drainage at least not "major drainage" this issue was resolved several years ago as forest direction... districts could ALSO include compartment number if they choose to." This wording is available in the KNF Forest Plan, Volume 2, Appendix A, page 17-9. The planning subunit was chosen as the analysis boundary to remain consistent with other analyses on the KNF.

Response to Comment #79: The data source, methods, and assumptions for the snag analysis are described on page III-165 of the FSEIS. While every acre of past management has not been monitored, representative stands of past management have and served to help establish the elements of a very conservative snag analysis. Snag Table 3-1 on page III-167 of the FSEIS describes the estimated existing condition for the snag resource including the effect of past and current firewood cutting along all roads in the planning unit.

12,13 admits that a high degree of reduction of old-growth habitat effectiveness has occurred due to management. Cumulative effects on old-growth habitat and on old-growth associated species include increased fragmentation, reduced older forest patch sizes, increased high-contrast edge, reduced availability of interior habitat, and decreased forested connectivity. The DSEIS does not discount edge effects or other fragmentation effects implications in its discussions of Forest Plan Standard (10%) compliance. "There are 49 old growth stands adjacent to 48 existing regeneration units (stands < 30 years old). These units create an edge influence on about 725 acres of old growth." (DEIS at III-102, 103.) This 725 acres is also not fully inclusive of "potential access by firewood cutters to remove standing snags." Id. Old growth is not truly "effective" with these edge effects, yet the DSEIS fails to consider this in its total "effective" old growth analyses. The DSEIS fails to provide any kind of analysis of how these fragmentation effects reduce the ability of the 10% "proxy" to provide for wildlife viability on a project-level or forestwide scale. The FS has still not sufficiently dealt with the issue of fragmentation, road effects, and past logging on old-growth species' habitat. Fragmentation effects would continue to reduce the ability to provide for the habitat needs of old-growth associated species for decades to come following project implementation and other activities in the project area. Mills (1994), criticizes a wildlife analysis performed by the Forest Service for a timber sale in the KNF. Mills points out that the FS's use of the term "viable" refers to habitat characteristics, not population dynamics. Mills goes on to explain the range of parameters that must be used to make a scientifically sound assessment of the viability of wildlife species. Population dynamics refers to persistence of a population over time—which is key to making predictions about population viability. Population dynamics include assessing population size, population growth rate, and linkages to other populations and must be included in a scientifically sound Population Viability Analysis (hereafter "PVA"). Ruggiero, et. al. (1994) also point out that a sound PVA must utilize measures of population dynamics. Finally, the 1999 draft NFMA planning regulations also recognize the importance of consideration of population dynamics for sustaining species. The issue of providing for the larger landscape needs of far-ranging forest carnivores (including old-growth dependent species and the grizzly bear and gray wolf) reveals the need to utilize the principles of Conservation Biology on a landscape level. Core areas of relatively undisturbed habitats need to be maintained. Linkages with other core areas need to be established, providing sufficient habitat components so the linkages, or corridors, are functional for genetic interchange purposes. Both core areas and linkages should be the focus of the watershed rehabilitation and recovery (such as road removal). Buffer zones around core areas should also be recognized in their contribution to habitat needs for these wildlife species. State-of-the-art conservation biology and the principles that underlie the agency's stated policy of "ecosystem management" dictate an increasing focus on the landscape-scale concept and 40	#80	**Response to Comment #80:** The analysis for old growth resources begins on page III-155 of the FSEIS. Together with the analysis for snag/down wood resources; and pileated woodpeckers, species associated with old growth and its elements are thoroughly addressed. Portions of the analysis include the effects of roads on interior habitats, snags, as well as the edge effects of existing units on old growth. This analysis acknowledges that species use and or presence could change as a result of thinning or prescribed burning in old growth (III-159). Alternative 3 was developed to address these concerns. For Young Dodge, specific areas were avoided in order to maintain connectivity between existing old growth (MA13) areas, especially along riparian environments, even though they do not contribute to designated (MA13) old growth.

design of large biological reserves accompanied by buffer zones and habitat connectors as the most effective (and perhaps only) way to preserve wildlife diversity and viability (Noss, 1993).

The continued fragmentation of the KNF is a major ongoing concern. It is documented that edge effects occur 10-30 meters into a forest tract (Wilcove et al., 1986). The size of blocks of interior forest that existed historically before management (including fire suppression) was initiated must be compared to the present condition. USDA Forest Service, 2004a states:

> Forested connections between old growth patches …(widths) are important because effective corridors should be wide enough to "contain a band of habitat unscathed by edge effects" relevant to species that rarely venture out of their preferred habitats (Lidicker and Koenig 1996 and Exhibit Q-17).

(USDA Forest Service, 2004a at 3-201.) Also,

> Timber harvest patterns across the Interior Columbia River basin of eastern Washington and Oregon, Idaho, and western Montana have caused an increase in fragmentation of forested lands and a loss of connectivity within and between blocks of habitat. This has isolated some wildlife habitats and reduced the ability of some wildlife populations to move across the landscape, resulting in long-term loss of genetic interchange (Lesica 1996, U.S. Forest Service and Bureau of Land Management 1996 and 1997).

(USDA Forest Service, 2004a at 3-216.)

USDA Forest Service, 2004a further discusses the fragmentation effects on old-growth habitat, effects that would be exacerbated by the Young Dodge timber sale:

> Harvest or burning in stands immediately adjacent to old growth mostly has negative effects on old growth, but may have some positive effects. Harvesting or burning adjacent to old growth can remove the edge buffer, reducing the effective size of old growth stands by altering interior habitats (Russell and Jones 2001). Weather-related effects have been found to penetrate over 165 feet into a stand; the invasion of exotic plants and penetration by predators and nest parasites may extend 1500 feet or more (Lidicker and Koenig 1996). On the other hand, adjacent management can accelerate regeneration and sometimes increase the diversity of future buffering canopy.
>
> The occurrence of roads can cause substantial edge effects on forested stands, sometimes more than the harvest areas they access (Reed, et al. 1996; Bate and Wisdom, in prep.). Roads that are open to the public expose many important wildlife habitat features in old growth and other forested stands to loss through firewood gathering and increased fire risk.
>
> Effects of disturbance also vary at the landscape level. Conversion from one stand condition to another can be detrimental to some old growth associated species if amounts of their preferred habitat are at or near threshold levels or dominated by linear patch shapes and limited interconnectedness (Keller and Anderson 1992). Reducing the block sizes of many later-seral/structural stage patches can further fragment existing and future old growth habitat (Richards et al. 2002). Depending on landscape position and extent, harvest or fire can remove forested cover that

provides habitat linkages that appear to be "key components in metapopulation functioning" for numerous species (Lidicker and Koenig 1996, Witmer et al. 1998). Harvest or underburning of some late and mid seral/structural stage stands could accelerate the eventual creation of old growth in some areas (Camp, et al. 1996). The benefit of this approach depends on the degree of risk from natural disturbances if left untreated.

Effects on old growth habitat and old growth associated species relate directly to … "Landscape dynamics—Connectivity"; and … "Landscape dynamics—Seral/structural stage patch size and shapes."

(USDA Forest Service, 2004a at 3-196 and 3-197.)

Harrison and Voller, 1998 assert "connectivity should be maintained at the landscape level." They adopt a definition of landscape connectivity as "the degree to which the landscape facilitates or impedes movement among resource patches." Also:

"Connectivity objectives should be set for each landscape unit. …Connectivity objectives need to account for all habitat disturbances within the landscape unit. The objectives must consider the duration and extent to which different disturbances will alienate habitats. … In all cases, the objectives must acknowledge that the mechanisms used to maintain connectivity will be required for decades or centuries."

(Id., internal citations omitted.) Harrison and Voller, 1998 further discuss these mechanisms:

Linkages are mechanisms by which the principles of connectivity can be achieved. Although the definitions of linkages vary, all imply that there are connections or movement among habitat patches. Corridor is another term commonly used to refer to a tool for maintaining connectivity. …the successful functioning of a corridor or linkage should be judged in terms of the connectivity among subpopulations and the maintenance of potential metapopulation processes. (Internal citations omitted.)

Harris, 1984 discusses connectivity and effective interior habitat of old-growth patches:

Three factors that determine the effective size of an old-growth habitat island are (1) actual size; (2) distance from a similar old-growth island; and (3) degree of habitat difference of the intervening matrix. …(I)n order to achieve the same effective island size a stand of old-growth habitat that is surrounded by clearcut and regeneration stands should be perhaps ten times as large as an old-growth habitat island surrounded by a buffer zone of mature timber.

Harris, 1984 discusses habitat effectiveness of fragmented old growth:

(A) 200-acre (80 ha) circular old-growth stand would consist of nearly 75% buffer area and only 25% equilibrium area. …A circular stand would need to be about 7,000 acres (2,850 ha) in order to reduce the 600-foot buffer strip to 10% of the total area. It is important to note, however, that the surrounding buffer stand does not have to be old growth, but only tall enough and dense enough to prevent wind and light from entering below the canopy of the old-growth stand.

That author believes that "biotic diversity will be maintained on public forest lands only if conservation planning is integrated with development planning; and site-specific protection areas must be designed so they function as an integrated landscape system." Harris, 1984 also states:

> Because of our lack of knowledge about intricate old-growth ecosystem relations (see Franklin et al. 1981), and the notion that oceanic island never achieve the same level of richness as continental shelf islands, a major commitment must be made to set aside representative old-growth ecosystems. This is further justified because of the lack of sufficient acreage in the 100- to 200-year age class to serve as replacement islands in the immediate future. …(A) way to moderate both the demands for and the stresses placed upon the old-growth ecosystem, and to enhance each island's effective area is to surround each with a long-rotation management area.

Wildlife biologist B.R. McClelland has for many years studied the relationship of cavity nesting birds, particularly the pileated woodpecker, to this very same larch-containing old-growth habitat. See: McClelland and McClelland, 1999; McClelland et al. 1979; and McClelland, 1977.

If the FS were study the Northern Region Overview, connect the dots and disclosed the obvious conclusions, it would be clear that the proposed logging to prevent the effects of "catastrophic" fire areas is severely detrimental to cavity nesting species, particularly the pileated woodpecker. This is the very best indicator for the kind of forest the FS has heavily logged, and proposes to avoid allowing to develop via prescribed natural fire. From USDA Forest Service, 1998-1999, pp. 25-26, under Western larch:

> Mixed severity fire intervals of 40-90 years followed by lethal fires on a 100-200 year + time frame are within the historical range of disturbance to which the seral species are adapted. In the absence of mixed severity fire or some stand thinning, on moist sites, larch is replaced by more shade tolerant species by 90-140 years. With thinning or mixed severity fire, larch can maintain site dominance for 200+ years.
>
> …(M)ixed severity fire often served to maintain or even increase the larch dominance in stands. Residual large tree cover (less than 20% canopy cover) after large stand replacing fire was common. This large tree residual structure (emergent structure) occurring singly or in small groups has declined in many areas. In addition, the areal extent of this cover type has decreased significantly. In many areas where a mix severity fire regime helped maintain a more diverse landscape structure with larger trees, the current landscapes are in a more homogenized landscape condition.
>
> …The loss of mixed-severity fire will result in much less recruitment of the type of mixed seral and climax species old growth type communities found in the past. There is also a risk of continued loss of the areal extent of the type due to the lack of mixed severity fire disturbance in early and mid-seral structural stages and a current lack of canopy openings large enough for successful larch regeneration in the mid and late successional communities.

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#81

Response to Comment #81: The analysis for the pileated woodpecker begins on page III-188 and old growth resources begins on page III-155 of the DSEIS. Together with the analysis for snag / down wood resources; and pileated woodpeckers, species associated with old growth and its elements are thoroughly addressed. Portions of the analysis include the effects of roads on interior habitats, snags, as well as the edge effects of existing units on old growth. This analysis acknowledges that species use and or presence could change as a result of thinning or prescribed burning in old growth (III-159). Alternative 3 was developed to address these concerns. Potential impacts on pileated woodpeckers from all alternatives including the No Action begins on page III-190.

The DSEIS falls far short of analyzing and disclosing these fragmentation effects on old-growth species' viability, caused by the current conditions and by the proposed timber sale.

Unfortunately, region-wide the FS has failed to meet Forest Plan old-growth standards, does not keep accurate old-growth inventories, and has not monitored population trends in response to management activities as required by Forest Plans and NFMA (Juel, 2003). There is no Regional policy or strategy the FS is actively pursuing to assure species viability across the region, as the Forest Supervisors and Regional Forester are shirking their duties as expressed in Forest Service directives.

The KNF's infamous poster, "Portrait of the Kootenai: A Working National Forest" reveals the extreme amount of habitat fragmentation in and adjacent to the KNF, on national forest land, on Plum Creek land, and on land of other ownerships. A similar Google Earth image is shown in Figure 1. The extremely fragmented nature of the old growth and other forest habitats has never been considered in any NEPA process on the KNF, including this one.

Figure 1.

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#82

Response to Comment #82: The analysis for old growth resources begins on page III-155 of the FSEIS. Together with the analysis for snag / down wood resources; and pileated woodpeckers, species associated with old growth and its elements are thoroughly addressed. Portions of the analysis include the effects of roads on interior habitats, snags, as well as the edge effects of existing units on old growth. This analysis acknowledges that species use and or presence could change as a result of thinning or prescribed burning in old growth (III-159). Alternative 3 was developed to address these concerns. For Young Dodge, specific areas were avoided in order to maintain connectivity between existing old growth (MA13) areas, especially along riparian environments, even though they do not contribute to designated (MA13) old growth.

VII. SOIL AND LAND PRODUCTIVITY Sec. 6. of the National Forest Management Act states: (g) As soon as practicable, but not later than two years after enactment of this subsection, the Secretary shall in accordance with the procedures set forth in section 553 of title 5, United States Code, promulgate regulations, under the principles of the Multiple-Use, Sustained-Yield Act of 1960, that set out the process for the development and revision of the land management plans, and the guidelines and standards prescribed by this subsection. The regulations shall include, but not be limited to- (3) specifying guidelines for land management plans developed to achieve the goals of the Program which- (E) insure that timber will be harvested from National Forest System lands only where- (i) soil, slope, or other watershed conditions will not be irreversibly damaged; NFMA regulations at 36 C.F.R. § 219.27 (Management requirements) state: (a) Resource protection. All management prescriptions shall-- (1) Conserve soil and water resources and not allow significant or permanent impairment of the productivity of the land; (b) Vegetative manipulation. Management prescriptions that involve vegetative manipulation of tree cover for any purpose shall-- (5) Avoid permanent impairment of site productivity and ensure conservation of soil and water resources; Forest Plan Soil Standards state: Soil and water conservation practices as outlined in the Soil and Water Conservation Practices Handbook (FSH 2509.22) will be incorporated into all land use and project plans as a principal mechanism for controlling non-point pollution sources and meeting soil and water quality goals, and to protect beneficial uses. Activities found not in compliance with the soil and water conservation practices or State standards will be brought into compliance, modified, or stopped. (Forest Plan at II-23). Forest Plan Soil Objectives state: Each project for which the use of heavy equipment is required shall evaluate the effect of equipment operation on soil productivity. When it is determined that equipment operation is a hazard to soil productivity the project plan shall: …establish a standard for how much of the project area will be allocated to skid trails, landings, temporary roads or similar areas of concentrated equipment travel. The standard shall minimize the area allocated to those uses to the extent practical. (Forest Plan at II-7). The amount of detrimental soil disturbance would increase with the implementation of Alternative 1, therefore soil productivity would be reduced. Some activities, such as log landing 45	#83	**Response to Comment #83:** All action alternatives would result in some level of detrimental soil disturbance (FSEIS, Pages III-18 to 21). However, all activities would meet Regional Soil Quality Standards and none of the proposed activities would result in permanent impairment to the land's productivity.

construction and intensive log skidding would essentially permanently reduce the productivity of the soil on those sites directly affected. It's not clear that the FS utilized the services of a soil scientist on the Interdisciplinary Team for the Young Dodge project, and likely relied upon soil surveys taken by personnel not adequately trained in this scientific discipline so vitally important for sound forest management. In order to comply with NFMA, its implementing regulations, and the Forest Plan Standard the FS adopted the Northern Region's Soil Quality Standards (Forest Service Manual FSM 2500-99-1) Therein the standards read: Policy. Design new activities that do not create detrimental soil conditions on more than 15 percent of an activity area. In areas where less than 15 percent detrimental soil conditions exist from prior activities, the cumulative detrimental effect of the current activity following project implementation and restoration must not exceed 15 percent. In areas where more than 15 percent detrimental soil conditions exist from prior activities, the cumulative detrimental effects from project implementation and restoration should not exceed the conditions prior to the planned activity and should move toward a net improvement in soil quality. It is clear that the intent of the Northern Region's Soil Quality Standards (SQS) is that the FS must, in each case, consider the cumulative effects of both past and proposed soil disturbances to assure the desired soil conditions are met. This includes impacts from activities that include logging, firewood gathering, livestock grazing, and motorized recreation impacts, for under Definitions the SQS state: Activity Area. A land area affected by a management activity to which soil quality standards are applied. Activity areas must be feasible to monitor and include harvest units within timber sale areas, prescribed burn areas, grazing areas or pastures within range allotments, riparian areas, recreation areas, and alpine areas. All temporary roads, skid trails, and landings are considered to be part of an activity area. Further down at FSM 2554.1, the SQS state: 1. Detrimental Soil Disturbance. These disturbances includes the effects of compaction, displacement, rutting, severe burning, surface erosion, loss of surface organic matter, and soil mass movement. At least 85 percent of an activity area must have soil that is in satisfactory condition. Detrimental conditions include: Compaction. Detrimental compaction is a 15 percent increase in natural bulk density. The cumulative effects of multiple site entries on compaction should also be considered since compacted soils often recover slowly. Rutting. Wheel ruts at least 2 inches deep in wet soils are detrimental. Displacement. Detrimental displacement is the removal of 1 or more inches (depth) of any surface soil horizon, usually the A horizon, from a continuous area greater than 100 square feet. Severely-burned Soil. Physical and biological changes to soil resulting from high-intensity burns of long duration are detrimental. This standard is used when 46	#84	Response to Comment #84: It is not uncommon for hydrologists to conduct the analysis for both soil and water issues. The hydrologist that conducted the soils surveys and analysis for this project has 13 years of experience conducting soil surveys and analyzing effects to soils, much of which was under the guidance of Lou Kuennen, whom the commenter cites multiple times. In addition, the hydrologist was trained to conduct soil surveys by personnel from the Rocky Mountain Research Station including Deborah Page-Dumroese and others that the commenter also cites. Before going to press, the soils analysis was reviewed by the current Kootenai National Forest Soil Scientist.

evaluating prescribed fire. Guidelines for assessing burn intensity are contained in the Burned-Area Emergency Rehabilitation Handbook (FSH 2509.13).

Surface Erosion. Rills, gullies, pedestals, and soil deposition are all indicators of detrimental surface erosion. Minimum amounts of ground cover necessary to keep soil loss to within tolerable limits (generally less than 1 to 2 tons per acres per year) should be established locally depending on site characteristics.

Soil Mass Movement. Any soil mass movement caused by management activities is detrimental.

3. Monitoring Methods. Visual methods are generally used to make initial evaluations of the effects of management activities on soils. The major objective of soil quality monitoring is to ensure that ecologically sustainable soil management practices are being applied. In most cases, qualitative estimates will be considered sufficient. The use of photo points provides good documentation and is recommended. Measurements and detailed sampling are used to calibrate visual methods and to conduct investigations where visual methods are inadequate or where benchmark or statistically valid sampling is required.

a. Areal Extent Sampling. Estimates of the percent of an activity area affected by detrimental soil disturbance can be made visually or by transecting. If statistically valid techniques are needed for benchmark sites, determine sample size and transect design using procedures described in Howes, Hazard, and Geist 1983.

b. Soil Sampling Techniques. Soil displacement, rutting, severely burned soil, erosion, mass movement, and above-ground organic matter can be observed and measured.

The SQS requires that calibration bulk density measures be done to make sure the very rough "walk-through visual estimates" done by non-soil scientists were valid. The SQS states:

> Measurements and detailed sampling are used to calibrate visual methods and to conduct investigations where visual methods are inadequate or where benchmark or statistically valid sampling is required.

"Howes, Hazard, and Geist 1983" cited in the SQS is also cited in the soil protocol often cited by the FS as representing the agency's "best science" methodology for other Region One timber sale NEPA analyses (*See* Howes, undated). Soil disturbance from historic logging would not necessarily be obvious from the cursory visual analysis used. Kuennen, et al. 1979, in a study done on the KNF and the adjacent Flathead NF, measured soil bulk densities, macropore porosities, and infiltration rates using paired observations of disturbed vs. undisturbed soils. They discovered that although "the most significant increase in compaction occurred at a depth of 4 inches… some sites showed that maximum compaction occurred at a depth of 8 inches… (and) Furthermore, … subsurface compaction occurred in glacial deposits to a depth of at least 16 inches." (.)

As the Ninth Circuit stated regarding this very same issue in *Lands Council v. Powell*:

> We are asked to trust the Forest Service's internal conclusions of the reliability of the spreadsheet model when the Forest Service did not verify the predictions of the spreadsheet model. Under the circumstances of this case, the Forest Service's basic

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> scientific methodology, to be reliable, required that the hypothesis and prediction of the model be verified with observation. The predictions of the model, which may be reliable across the entire Forest, were not verified with on the ground analysis. The Forest Service, and consequently the public at large, has no way to know whether the projection of the Project area's soils was reliable. Was the Forest Service "dead on" or "dead wrong?"

One merely must substitute equally unvalidated walk-through visual estimates in this case for the "spreadsheet model" in that case, and the same question remains unanswered: Was the Forest Service "dead on" or "dead wrong?

#85 Furthermore, the DSESIS does not even commit to any post-logging monitoring or measures of detrimental disturbance.

#86 It should be noted that the FS assumes that maintaining soil productivity is achieved simply by limiting detrimental disturbance to no more than 15% of an Activity Area (logging or "treatment" unit). Unfortunately, the scientific adequacy of the FS's methodology for maintaining soil productivity on the KNF has never been demonstrated. The FS's determination that it may permanently damage the soil on 15% of an activity area and still meet NMFA and planning regulations is arbitrary. The DSEIS does not cite any scientific basis for adopting the 15% numerical limit.

#87 Furthermore, the DSEIS fails to cite the results of Forest Plan-required soil productivity monitoring. The Forest Plan requires monitoring to prevent ">15% decrease in site productivity" (Forest Plan at IV-12). "Site productivity" is not defined in the Forest Plan, however the Deerlodge Forest Plan (also a Region One national forest) defines it as "production capability of specific areas of land" (Deerlodge Forest Plan at VII-33). Refining this, the Soil and Water Conservation Practices Handbook (FSH 2509.22) defines "Soil Productivity" as "The capacity of a soil to produce a specific crops such as fiber and forage, under defined levels of management. It is generally dependent on available soil moisture and nutrients and length of growing season." The DSEIS fails to deal with the very basic question that the Forest Plan monitoring item asked: What are the quantitative effects of management activities on the productivity of the land?

It is quite curious that the current levels of detrimental soil disturbance in past activity areas do not square with the findings from soil monitoring on the KNF as discussed in Forest Plan monitoring reports. Those reports disclose that much of the logging done in the past resulted in extremely high levels of detrimental soil disturbance, well above the 15% areal limit. This discrepancy may be the result of the DSEIS estimations being performed by non-soil scientists. From the Fiscal Year 1997 report: "The FY 92 Monitoring Report stated that 49% of the surveyed acres, to that point, were beyond the Plan variability (15%) limits." The Monitoring Reports also disclose that detrimental soil disturbance had exceeded the 15% limits since 1992, although at a reduced frequency.

Why is the FS afraid of actually disclosing the level of non-consistency of old activity areas with the current 15% areal extent detrimental disturbance limits in the SQS? The amount of hydrologically altered or non-functioning soils in any given watershed would provide some basis

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Response to Comment #85: The FSEIS does commit to post-project monitoring of soil detrimental disturbance and coarse woody debris on page 3-1 of Appendix 3. The Rexford Ranger District is committed to soil monitoring, as is the Kootenai National Forest, which has one of the most extensive soil monitoring programs in the Region.

Response to Comment #86: Soil quality standards were developed by selecting soil indicators that are visual aids for evaluating the effects of management activities on soil productivity. Soil quality standards provide benchmark values that indicate when changes in soil properties and soil conditions could result in significant change or impairment of soil quality based on available research and Regional experience (Page-Dumroese et al, 2000).

Current understanding is that site quality will be maintained if less than 15% of an area is detrimentally impacted after disturbance (Dumroese et al 2000; Powers et al 1998). Findings from the Long Term Soil Productivity (LTSP) study show that soils respond to and recover from density impacts at different levels and that tree growth without understory competition are unaffected by compaction (Powers et al 2005). Further, evaluations of current conditions on KNF suggest soil recovery on hundreds of monitored units that were harvested since the turn of the 20th century where almost three quarters show impacts of only 0 to 5%. This implies that management activities meet the requirements of the MUSYA (16 USC 531) to maintain soils " without impairment of the productivity of the land" and NFMA (16 USC 1604 (g) (3) (E)(i)) to prevent irreversible damage.

Response to Comment #87: The effects of management activities to soil productivity are discussed with regard to soil disturbance and nutrient cycling in the FSEIS on Pages III-19 to 24. Cumulative effects of past, present, and reasonably foreseeable activities are discussed in the FSEIS on Pages III-24 to 29.

for assessment of watershed cumulative impacts and the R-1 Standards even recognize this. Unfortunately, the KNF does not. The DSEIS fails to link the current and cumulative soil disturbance across thousands of acres in the Project Area to the impacts on water quantity and quality. #88

Further compromising soil productivity in the KNF is the failure to adequately address the spread of noxious weeds, which have the potential effect of reducing site productivity by replacing natural vegetation and competing with same for soil nutrients, moisture, etc.

In fact, the KNF is still "off track" in meeting Forest Plan objectives and goals for controlling noxious weeds. #89

The Sheep Creek Salvage FEIS (USDA Forest Service, 2005a) states at p. 173:

> Noxious weed presence may lead to physical and biological changes in soil. Organic matter distribution and nutrient flux may change dramatically with noxious weed invasion. Spotted knapweed (*Centaurea biebersteinii D.C.*) impacts phosphorus levels at sites (LeJeune and Seastedt, 2001) and can hinder growth of other species with allelopathic mechanism. Specific to spotted knapweed, these traits can ultimately limit native species' ability to compete and can have direct impacts on species diversity (Tyser and Key 1988, Ridenour and Callaway 2001).

The FS has no idea how the productivity of the land been affected in the project area and forestwide due to noxious weed infestations, nor how that situation is expected to change. This is reflected in recent Forest Plan Monitoring and Evaluation Reports.

The KNF in USDA Forest Service, 2005c states:

> Weed infestations are known to reduce productivity and that is why it is important to prevent new infestation sand to control known infestations. …Where infestations occur off the roads, we know that the productivity of the land has been affected from the obvious vegetation changes, and from the literature. The degree of change is not generally known. …(S)tudies show that productivity can be regained through weed control measures… (FEIS at 4-61.) #90

However, despite being prompted several times in comments, the FS never comes close to pointing out the results of weed treatments on the KNF that have been proven to significantly reduce noxious weed populations over time, or prevent spread. This is an ongoing issue of land productivity for which the FS is in violation of NFMA. Instead, the DSEIS and the KNF keep claiming, without any real basis, that their attention to the weeds issue is leading to meaningful progress. #91

The FS is avoiding the entire issue of maintaining soil productivity. As indicated in the SQS and FSH 2509.18, the FS assumes that maintaining soil productivity is achieved simply by limiting detrimental disturbance to no more than 15% of an activity area (cutting unit). Unfortunately, the scientific adequacy of the FS's methodology for maintaining soil productivity on has never been demonstrated. The FS's determination that it may permanently damage the soil on 15% of an activity area and still meet NMFA and planning regulations is arbitrary. Neither the DSEIS, the

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Response to Comment #88: The hydrologic implications of soil disturbance on watersheds are addressed in the Water Section of the FSEIS, Pages III-108 to 136. RHCAs and BMPs prevent most management activities from impacting water quality by minimizing sediment production and minimizing the potential for any sediment that is generated to reach a water body (FSEIS, Pages III-118 to 119, III-124 to 125, and III-126 to 128). The mechanism whereby soils disturbance most affects water quantity/quality is through soil compaction, affecting infiltration and runoff patterns. The area where sediment has the greatest potential to be delivered to streams is where roads are adjacent to, or cross streams. Roads are addressed extensively in the analysis of water quality (FSEIS, Page III-122), are included in peak flow modeling in the water quality analysis (FSEIS, Pages III-120 to 122), and are discussed in cumulative effects (FSEIS, Pages III-126-135). Regardless of the modeling involved with water quality or quantity, the FSEIS (Pages III-114 to 120) states that 10+ years of monitoring has shown that similar levels of disturbance in the past in Young and Dodge Creeks have not degraded stream conditions.

Response to Comment #89: FSEIS pages III- 54-59 analyze noxious weeds within the Project Area.

Response to Comment #90: A table showing the size and location of weed infestations within the Project Area is included in the FSEIS on page III-55.

Response to Comment #91: The effectiveness of the weed treatments across the KNF are disclosed in the 2007 Forest Plan monitoring report, available at http://www.fs.usda.gov/detail/kootenai/landmanagement/planning/

Forest Plan, nor the SQS cite adequate scientific basis for adopting 15% as a numerical limit—it is simply arbitrary. Our comments included, "…the FS does not know how losses in land productivity has and will lead to reductions in timber yield over second and later rotations." That comment was entirely ignored. Even if timber were the only accepted use of the Forest, it would be extremely irresponsible for the FS to never factor in logging-induced losses in productivity, leading to potentially serious reductions over time in expected timber yields. In response to our comments on economics, the KNF's recent Trego DN states: Sustained yield was defined in the Kootenai Forest Plan, 1987, (Vol. 1, Chapter VI, Glossary) as "the achievement and maintenance in perpetuity of a high-level annual or regular periodic output of the various renewable resources of the National Forest System without permanent impairment of the productivity of the land." Sustained yield is based on the lands' ability to produce. (Trego DN Appendix A-54.) That's exactly our point here: Since the FS has no idea how much soil has been permanently impaired either within the project area or forestwide, it has no clue if "sustained yield" is merely an empty promise. It may be the case that the Forest Service chose 15% as it's upper limit on soil damage within a unit merely because it's known that modern clearcutting methods can easily avoid compacting more that 15% of a unit in while removing all the merchantable trees and burning the slash. Of course, that's just speculation—we many never know, because the SQS were developed internally by the agency, without the use of any public process such as Forest Plan development, NEPA, or independent scientific peer review. In fact, in response to TLC's DEIS comments, the FS replies: The 15% change in aerial extent realizes that timber harvest and other uses of the land result in some impacts and impairment that are unavoidable. This limit is based largely on what is physically possible, while achieving other resource management objectives. So the agency admits that the limit is based on the fact that it is not feasible to do much less damage than 15% of an activity area while carrying out industrial logging, and that the limit has nothing to do with the science of maintaining soil productivity! In response to TLC's concern that the 15% areal extent limit had been confused by the Forest Service with the 15% increase in bulk density in any given site that has experience soil compaction, as our cite of Powers and Nesser discussed, the KNF stated: Powers (1990) cites that the rationale bulk density is largely based on collective judgment. The FS estimates that a true productivity decline would need to be as great as 15% to detect change using current monitoring methods. Thus the soil-quality standards are set to detect a decline in potential productivity of at least 15%. This does not mean that the FS tolerates productivity declines of up to 15%, **but merely that it recognizes problems with detection limits.** Also, a 15% increase in bulk density may not be detrimental to productivity; site and soil productivity depends on the soil and ecosystem in which it is found. 50	#92	Response to Comment #92: The scientific uncertainty surrounding the 15% Standard is discussed in the Soils Specialist Report in the Soil and Water Project File. This project is in compliance with both Regional Soil Quality Standards and NFMA (FSEIS, Pages III-9 to 29).

(Emphasis added.) So we have the SQS's 15% areal extent limit being based on mere feasibility rather than concerns over soil productivity, and additionally we have the 15% bulk density increase limit based upon the limitations of detection by FS bulk density measuring methods—not concerns over soil productivity!

The loss of timber yield due to cumulative soil damage in the project area is not quantified in the DSEIS, nor has the KNF quantified the loss of timber yields forestwide.

The DSEIS reveals that there has been heavy logging already done in the project area, yet the KNF fails to disclose the amount of detrimental disturbance currently present within even a single previously established activity area. It seems the FS's position is that areas that have experienced significant losses of soil productivity from logging, roads, log landings, off-road vehicle use, and private land activities can be virtually unlimited in any project area or watershed, regardless of what new is proposed. The DSEIS inexplicably analyzes the impacts of past logging on soil properties and soil productivity in far different ways than it does for the proposed activities. This is quite evident for detrimental disturbances, large woody debris, and impacts on sensitive soils. This is a serious shortcoming of the DSEIS, rendering its soil cumulative effects analyses practically meaningless.

The FS utterly failed to provide a cumulative effects analysis that considered how much detrimental soil damage occurred from past management activities since the DSEIS equates "analysis area" for soils with "activity area" as per the SQS. This is absolute nonsense. The cumulative effects analysis for every other resource analyzed in the DSEIS goes beyond the proposed cutting units. The FS wants to ignore this issue for soils, because the it knows that inattention to limiting soil damage in past timber sales in the project area has resulted in massive soil damage. This is tacitly admitted in past monitoring reports, which disclose that much of the logging done in the past resulted in extremely high levels of detrimental soil disturbance, well above the 15% areal limit. From the Fiscal Year 1997 report: "The FY 92 Monitoring Report stated that 49% of the surveyed acres, to that point, were beyond the Plan variability (15%) limits." The Monitoring Reports also disclose that detrimental soil disturbance had exceeded the 15% limits since 1992, although at a reduced frequency.

A problem with the SQS (and the DSEIS's interpretation of them) is that they do not set any rational limits for cumulative loss in soil productivity outside the activity areas of the proposed timber sale. There is nothing in the DSEIS that itemizes the various kinds and levels of disturbance in the various disturbed sites in each project area watershed. The DSEIS reveals the extreme amount of logging already done in the Analysis Area. Yet the DSEIS fails to disclose the amount of detrimental disturbance currently present in even a single old activity area.

Based on such data the KNF would be in a better position to analyze the water yield and other hydrological implications of the various amounts of hydrologically dysfunctional soils, within each project area watershed and subwatershed, and disclose them to the public. This is also in the SQS. The DSEIS does not consider compacted soils in its cumulative effects watershed analyses. For a logging project EIS, the Bitterroot National Forest admitted that subwatersheds that have high levels of existing soil damage could indicate a potential for hydrologic and silviculture concerns. (USDA Forest Service, 2005b, p. 3.5-11, 12.)

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Response to Comment #93: Results from the long-term soil productivity studies (Sanchez et al 2006, Fleming et al 2006) indicate that the levels of soil disturbance typically occurring during timber harvest have no effect of timber yield. Personal observations as a district silviculturalist for 22 years (Joe Lewicki) have indicated that our managed stands often out-yield natural stands, in spite of the detrimental disturbance that occurs during harvest operations,. My observations are supported by Powers 1999, when in his critique of plantation forestry he concludes on page 286 that "direct evidence of productivity decline in managed forests is rare, whereas the converse seems common. Most records indicate sizable gains in actual productivity when planted forests replace natural forests, and suggest that potential productivity may be sustained as well."

Response to Comment #94: The analysis of proposed activities with regard to soils was done the same as the analysis of past impacts (FSEIS, Page III-17). Table 3-5 on Pages III-20 and 21 of the FSEIS clearly display the disturbance numbers for past, proposed, and reasonable foreseeable activities for each unit. The predicted values for each of the proposed activities are based on extensive field monitoring of similar activities and are displayed in the FSEIS on Pages III 10 and 11.

Response to Comment #95: Table 3-5 on Pages III-20 and 17 of the FSEIS clearly display the disturbance numbers for past, proposed, and reasonable foreseeable activities for each unit. All units with past activities were field surveyed. "Field surveys consisted of random stratified transect/sample point methods with confidence at or above 80% ± 5% with the majority of surveys being 95% ± 5%" (FSEIS, Page III-9). Table 3-5 on Pages III-20 and 21 of the FSEIS display the disturbance numbers for past, proposed, and reasonable foreseeable activities for each unit. The existing disturbance numbers identified in the FSEIS are the result of the currently measurable effects of past disturbance in the activity areas "including but not limited to: timber harvest (trails and landings), grazing, temporary road construction, off highway vehicles, natural disturbances, firewood gathering, etc." (FSEIS, Page III-9).

Response to Comment #96: The scientific uncertainty surrounding the 15% Standard is discussed in the Soils Specialist Report in the Soil and Water Project File. However, this project is in compliance with both Regional Soil Quality Standards and NFMA (FSEIS, Pages III-9 to 29). The documents titled 'Kuennen 2007 Appendix C1 – Kootenai National Forest Soil Monitoring' and 'North End Post-Activity Soil Monitoring' display the activity areas monitored in the past, including those in the Project Area, and can be found in the Soil and Water Project File.

Response to Comment #97: The FSEIS does consider the impacts of 'hydrologically dysfunctional soils' in the Water analysis (Pages III-108 to 135). Peak flow modeling includes increased runoff factors for disturbed areas such as harvest units and roads. The analysis of changes in peak flow can be found on Pages III-120 to 122 of the FSEIS. Cumulative effects to peak flows resulting from past, present, and reasonably foreseeable activities can be found on Pages III-126 to 135 of the FSEIS. In addition, for those soil disturbance effects that peak flow modeling does not address like sediment and the rerouting of water, road density and road BMP analysis was conducted (FSEIS, Pages III-122 to 125, and Pages III-131 to 134). The true indicator of the cumulative effects to the watershed that result from soil disturbance is the stream conditions within the watershed itself. There are 10+ years of stream monitoring data displayed in the FSEIS (Pages III-115 to 120). The monitoring data for Young and Dodge Creeks show both as being stable and in good condition.

The Revised Forest Plan for the Payette National Forest[13] does contain a Standard that limits "total soil resource commitment," (TSRC) which includes areas essentially permanently committed to impervious surfaces such as "roads, dedicated trails and landings, administrative sites, parking lots and mine excavations." The Standard, measured over a logical geographic area such as timber sale area is 5%. There is no reason that the KNF continues to ignore the ecological justifications for such a Standard.

The KNF's method of soil analysis seems designed to enable the KNF to go into an area like the project area that has been heavily impacted by past logging and road building—and cherry-pick some of the remaining unlogged forest stands for logging **without** having to take into consideration the cumulative impact of repetitive timber production on the affected landscape. Without a broader view of the cumulative impacts from such repeated entries, this kind of mismanagement of public lands is simply not consistent with NFMA or NEPA.

The Ninth Circuit addressed a very analogous situation in *Lands Council v. Powell*, where the IPNF proposed more logging in a watershed that was no longer properly functioning because of the effects of past logging. As the Court noted in that case, "[c]umulative effects analysis requires the [FEIS] to analyze the impact of a proposed project in light of that project's interaction with the effects of past, current, and reasonably foreseeable projects… [Here] there is no discussion of the connection between individual harvests and the prior environmental harms from those harvests that the Forest Service now acknowledges." *Ibid.*, at 1027. By analogy, the same failure of analysis is evident for soils in the DSEIS for this timber sale.

It is clear that the intent of the SQS is that the FS must, in each case, consider the cumulative effects of both past and proposed soil disturbances to assure that soil productivity will be maintained. This includes impacts from activities that include logging, motorized vehicle use, etc. Such cumulative effects analysis found in the Soil and Water Conservation Practices Handbook (FSH 2509.22), adopted as a Standard under the KNF Forest Plan. FSH 2509.22 states:

> Practice 11.01 – Determination of Cumulative Watershed Effects
> OBJECTIVE: To determine the cumulative effects or impact on beneficial water uses by multiple land management activities. Past, present, or reasonably foreseeable future actions in a watershed are evaluated relative to natural or undisturbed conditions. Cumulative impacts are a change in beneficial water uses caused by the accumulation of individual impacts over time and space. Recovery does not occur before the next individual practice has begun.
>
> EXPLANATION: The Northern and Intermountain Regions will manage watersheds to avoid irreversible effects on the soil resource and to produce water of quality and quantity sufficient to maintain beneficial uses in compliance with State Water Quality Standards. Examples of potential cumulative effects are: 2) excess sediment production that may reduce fish habitat and other beneficial uses; 3) water temperature and nutrient increases that may affect beneficial uses; 4) compacted or disturbed soils that may cause site productivity loss and increased soil erosion; an 5)

[13] http://www.fs.fed.us/r4/sawtooth/arevision/payetteplan.htm

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#98

Response to Comment #98: As stated in the FSEIS, Page III-8 "…effects of the alternative will focus on individual activity areas as defined by the Forest Service Manual (R-1 Supplement No. 2500-99-1)." A more in-depth discussion of why this is the appropriate scale to analyze effects is on Page III-9-11 of the FSEIS. For further information please refer to the 'Region 1 Soils Technical Guide' and 'Forest Soil Disturbance Monitoring Protocol' Volumes 1 and 2 in the Soil and Water Project File.

Comment	#	Response
increased water yields and peak flows that may destabilize stream channel equilibrium. IMPLEMENTATION: As part of the NEPA process, the Forest Service will consider the potential cumulative effects of multiple land management activities in a watershed which may force the soil resource's capacity or the stream's physical or biological system beyond the ability to recover to near-natural conditions. A watershed cumulative effects feasibility analysis will be required of projects involving significant vegetation removal, prior to including them on implementation schedules, to ensure that the project, considered with other activities, will not increase sediment or water yields beyond or fishery habitat below acceptable limits. The Forest Plan will define these acceptable limits. The Forest Service will also coordinate and cooperate with States and private landowners in assessing cumulative effects in multiple ownership watersheds. The DSEIS also fails to disclose data from project area surveys for coarse woody debris in old logging units. Further, Adams and Froehlich (1981) provide reasons why impacts beyond the directly compacted 15% of an area must be considered in any reasonable definition of soil productivity: Since tree roots extend not only in depth but also in area, the potential for growth impact also becomes greater as compaction affects more of the rooting area. In a thinned stand, for example, you can expect the greatest growth impacts in residual trees that closely border major skid trails or that have been subject to traffic on more than one side of the stem. In other words, when an Activity Area reaches 15% detrimentally impacted soils via compaction, tree growth outside the skid trail, or beyond the compacted area, is affected. This is ignored in the FS's methodology for assuring soil productivity losses are consistent with NFMA. Following a study by Cullen et al., (1991) which was carried out on the Kootenai NF and the Flathead NF, the authors concluded: "This result lends support to the general observation that most compaction occurs during the first and second passage of equipment." And Page-Dumroese (1993), in a FS research report investigating logging impacts on volcanic ash-influenced soil in the Idaho Panhandle NF, states, "Moderate compaction was achieved by driving a Grappler log carrier over the plots twice." Page-Dumroese (1993) also cited other studies that indicated: "Large increases in bulk density have been reported to a depth of about 5 cm with the first vehicle pass over the soil." Williamson and Neilsen (2000) assessed change in soil bulk density with number of passes and found 62% of the compaction to the surface 10cm to come with the first pass of a logging machine. In fine textured soils Brais and Camire (1997) demonstrated that the first pass creates 80 percent of the total disturbance to the site. Adams and Froehlich (1981) state, "Unfortunately, little research has yet been done to compare the compaction and related impacts caused by low-pressure and by conventional logging vehicles." 53	#99	**Response to Comment #99:** Coarse woody debris monitoring data was not displayed in the DSEIS but can be found in the Soil and Water Project File. Overall the Rexford and Fortine districts have been 90% effective in meeting CWD goals.

The Northern Region recognizes that soil quality standards must be validated. The SQS require Forest Supervisors to:

- Assess … whether (soil quality standards) are effective in maintaining or improving soil quality;
- Evaluate the effectiveness of soil quality standards and recommend adjustments to the Regional Forester; and
- Consult with soil scientists to evaluate the need to adjust management practices or apply rehabilitation measures.

This all implies that monitoring must be undertaken. Furthermore, the SQS recognizes that soil productivity is defined not merely in terms of the absence of meeting the 15% standard. "Soil Function" is defined thus:

> Primary soil functions are: (1) the sustenance of biological activity, diversity, and productivity, (2) soil hydrologic function, (3) filtering, buffering, immobilizing, and detoxifying organic and inorganic materials, and (4) storing and cycling nutrients and other materials.

And "Soil Quality" is defined as "The capacity of a specific soil to function within its surroundings, support plant and animal productivity, maintain or enhance water and air quality, and support human health and habitation."

Neither soil function nor soil quality, as the SQS defines it, have ever been monitored on the KNF following management activities. This has long-term implications for sustained timber production as well as the ecological relationships in the soil upon which timber production so very much depends. Unfortunately, the FS seems to have only interpreted monitoring requirements in terms of maintaining no more than 15% of activity areas in a detrimentally disturbed condition.

The Forest Management Handbook at FSH 2509.18 directs the FS to do validation monitoring to "Determine if coefficients, S&Gs, and requirements meet regulations, goals and policy" (2.1 – Exhibit 01). It asks what we are asking: "Are the threshold levels for soil compaction adequate for maintaining soil productivity? Is allowing 15% of an area to be impaired appropriate to meet planning goals?" The Ecology Center recently asked the Northern Region if they have ever performed this validation monitoring of its 15% Standard, in their February 26, 2002 Freedom of Information Act request to the Regional Forester, requesting:

> The Forest Management Handbook at FSH 2509.18 provides the Forest Service with examples of validation monitoring to "Determine if coefficients, S&Gs, and requirements meet regulations, goals and policy." It asks "Are the threshold levels for soil compaction adequate for maintaining soil productivity? Is allowing 15% of an area to be impaired appropriate to meet planning goals?" We request all documentation of validation monitoring by the Forest Service in the Northern Region that answers those two questions.

The Regional Office's reply letter stated that there is no documentation that responds to this request.

The SQS superceded similar directives issued in 1994 (FSH 2509.18). Both versions of these Regional directives have required implementation and effectiveness monitoring. But as the Regional Office's reply to the Ecology Center FOIA indicates, the DSEIS is unable to cite the results of any monitoring, required by the Standards, to provide a basis for assuming the Standards actually protect soil productivity.

Page-Dumroese et al. 2000 (an earlier version of which is cited in the SQS) emphasize the importance of validating soil quality standards using the results of monitoring:

> Research information from short- or long-term research studies supporting the applicability of disturbance criteria is often lacking, or is available from a limited number of sites which have relative narrow climatic and soil ranges. …Application of selected USDA Forest Service standards indicate that blanket threshold variables applied over disparate soils do not adequately account for nutrient distribution within the profile or forest floor depth. These types of guidelines should be continually refined to reflect pre-disturbance conditions and site-specific information. (Abstract.)

Soil productivity can only be protected if it turns out that the soil Standards work. To determine if they work, the FS would have to undertake objective, scientifically sound measurements of what the soil produces (grows) following management activities. But the FS has never done this on the KNF, despite Forest Plan monitoring requirements.

Also, the DSEIS fails to cite the results of monitoring that prove its soil mitigation measures can reasonably be expected to be effective in protecting and maintaining soil productivity.

Also, "Monitoring of winter-logging soil effects conducted by the Forest Soil Scientist on the Bitterroot National Forest over the past 14 years has shown that 58% of the ground-based, winter-logged units failed to meet the SQS. Winter-logging resulted in an average of 16% detrimentally damaged soil." (USDA Forest Service, 2005b, p. 3.5-21.)

It is reasonable to expect that in order for the FS to assure that soil productivity is not or has not been significantly impaired—to meet Forest Plan goals for assuring that the forest is producing a sustained yield of timber, or to allow for the development of effective old-growth forests—tree growth must not be significantly reduced by soil-disturbing management activities. Grier and others (1989), in a FS General Technical Report, adopted as a measure of soil productivity: "the total amount of plant material produced by a forest per unit area per year." (P. 1.) And they cite a study finding "a 43-percent reduction in seedling height growth in the Pacific Northwest on primary skid trails relative to uncompacted areas" for example. And in another FS report, Adams and Froehlich (1981) state:

> Measurements of reduced tree and seedling growth on compacted soils show that significant impacts can and do occur. Seedling height growth has been most often studied, with reported growth reductions on compacted soils from throughout the U.S. ranging from about 5 to 50 per cent.

Another big problem is that the DSEIS largely relies on the FS's track record of relying upon Best Management Practices (BMPs) to base its claims that soil productivity will be maintained

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#100

Response to Comment #100: Both Forest Plan Monitoring and district monitoring are cited repeatedly throughout the Soils Section of the FSEIS, Pages III-7 to 29. The scientific uncertainty surrounding the 15% Standard is discussed in the Soils Specialist Report in the Soil and Water Project File. However, this project is in compliance with both Regional Soil Quality Standards and NFMA (FSEIS, Pages III-14 to 25). The documents titled 'Kuennen 2007 Appendix C1 – Kootenai National Forest Soil Monitoring' and 'North End Post-Activity Soil Monitoring' display the activity areas monitored in the past, including those in the Project Area, and can be found in the Soil and Water Project File. The adequacy or basis for soil productivity standards are beyond the scope of this project and are more appropriately handled at the Regional or National level. The effects of soil disturbance on soil productivity are currently being addressed by a cooperative research study called the North American Long Term Soil Productivity Study (LTSP). The five-year results have been published (Page-Dumroese et al 2006, Flemming et al 2006, and Sanchez et al 2006) as well as many other papers regarding the research. These studies are following control and managed sites across North America. To date there has been no reduction in tree growth noted as a result of compaction and organic removal on soils similar to those in the Project Area.

#101

Response to Comment #101: See response to comment #100.

following logging practices. However, BMP monitoring does not even attempt to measure post-project soil productivity, since the audits are not scientifically designed to do so. Nor does it result in quantitative measures of detrimental disturbance, or soil productivity, which are the most relevant factors here. #102

In sum, the DSEIS does not rely upon scientifically credible data or analysis, so the Decision to cause more soil disturbance, resulting in unknown losses in soil productivity, is arbitrary and capricious.

VIII. POPULATION VIABILITY AND HABITAT MANAGEMENT OF MANAGEMENT INDICATOR AND SENSITIVE SPECIES

The questions a cumulative effects analysis for MIS and Threatened, Endangered, and Sensitive (TES) species is supposed to answer are: How much habitat in the project area and "on a forestwide, landscape level" have all projects modified, adding together past and Young Dodge timber sale impacts? And: How do the remaining, depleted habitat conditions compare to the habitat needs for a well-distributed, viable population of such species on the KNF?

The DSEIS's cumulative effects analyses evade those simple questions of such vital importance. In fact, the DSEIS as written simply cannot support a decision to deplete more wildlife habitat.

#103

The DSEIS fails to disclose the changes in wildlife habitat due to past management activities in meaningful terms. Those terms, required under the National Forest Management Act (NFMA) relate to the concept of viable populations, meaning minimum numbers of individual members of a species, well-distributed over the KNF. The DSEIS doesn't even attempt to disclose how past actions have affected population numbers of MIS and TES species, nor their distributions in the project area or over the KNF.

Logging, roadbuilding and other disturbance associated with the proposed timber sale and other cumulative impacts could affect northern goshawk nesting, post-fledging family habitat, alternative nesting, foraging, competitors, prey and potential habitat, including areas far from cutting units. Research in the Kaibab National Forest found that goshawk populations decreased dramatically even after partial logging and even when large buffers around nests were provided (Crocker-Bedford, 1990). The rationale used by the FS in downlisting this species from Sensitive species list was provided by a non-peer reviewed source—Samson. #104

The KNF's Northeast Yaak Draft Supplemental EIS (USDA Forest Service 2006c) disclosed that a grim situation exists **forestwide** for the goshawk:

> Using the modeled nesting habitat acres from Johnson (ibid), the minimum PPI for the Forest would be 139 goshawk pair. The most recent data show 34 known or suspected pairs and an additional 10 known individual goshawks on the Forest (Kootenai NF records).

The implications of having a potential population index (PPI) of 139 pair of goshawks on the Forest, with only 34 known or suspected pairs and an additional 10 known individual goshawks

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Response to Comment #102: BMPs are proven practices that reduce the effects of activities on soils and water resources. District and Forest monitoring of BMPs and soil disturbance are cited and used throughout the Soils Analysis (FSEIS, Pages III-7 to 29). Appendix 2 of the FSEIS displays the effectiveness that has been monitored across the Kootenai. The scientific uncertainty surrounding the 15% Standard is discussed in the Soils Specialist Report in the Soil and Water Project File. This project is in compliance with both Regional Soil Quality Standards and NFMA. The documents titled 'Kuennen 2007 Appendix C1 – Kootenai National Forest Soil Monitoring' and 'North End Post-Activity Soil Monitoring' display the activity areas monitored in the past, including those in the Project Area, and can be found in the Soil and Water Project File. The scientific adequacy or basis for soil productivity standards are beyond the scope of this project and are more appropriately handled at the Regional or National level. The effects of soil disturbance on soil productivity are currently being addressed by a cooperative research study called the North American Long Term Soil Productivity Study (LTSP). The five-year results have been published (Page-Dumroese et al 2006, Flemming et al 2006, and Sanchez et al 2006) as well as many other papers regarding the research. These studies are following control and managed sites across North America. To date there has been no reduction in tree growth noted as a result of compaction and organic removal on soils similar to those in the Project Area.

Response to Comment #103: Effects on the wildlife resources, including those on specific species begins on page III-155 of the FSEIS. Under each resource or species, the existing condition is provided including the quantitative amount of habitat and / or expected population numbers the habitat is capable of supporting. The cumulative effect of past actions on these habitats and species is provided under each specific resource under the section titled "Cumulative Effects – *Summary of the Existing Condition*."

Response to Comment #104: The goshawk is analyzed beginning on page 194 of the FSEIS.

are quite serious for forestwide population viability.[14] Liberally including even each "suspected" pair as part of the existing population, the total 34 pairs is only about 25% of the PPI. This is well below the 40% level the KNF insists proves population viability on the Forest. The available evidence indicates that the low number of goshawks in the project area and forestwide **do not** constitute minimum numbers and distribution indicative of a viable population on the KNF. Yet, the EIS failed to adequately incorporate this information in its decision to omit discussion of the northern goshawk. Furthermore, in response to comments the FS simply states that bringing up this issue in comments on the DEIS is outside the scope of the analysis.	#105	Response to Comment #105: The goshawk is discussed beginning on page III-194-in the FSEIS.
Nowhere was there an analysis that addressed why all the "modeled" habitat resulted **in no individuals existing in the Northeast Yaak project area.** Whereas a reasonable person might conclude that the heavily-logged present condition of that Project Area might have something to do with this, apparently this hasn't dawned on the FS.		
USDA Forest Service 2006c also disclosed that a similar grim situation exists **forestwide** for the goshawk: Using the modeled nesting habitat acres from Johnson (ibid), the minimum PPI for the Forest would be 139 goshawk pair. The most recent data show 34 known or suspected pairs and an additional 10 known individual goshawks on the Forest (Kootenai NF records). The DSEIS's analysis on goshawks ignores important scientific information on goshawk habitat requirements. Reynolds, et al. 1992 provide a basis for a northern goshawk conservation strategy that could be implemented if forestwide habitat considerations were to be truly taken into account. They suggest that it is essential to viability of goshawks that 20-50% of old growth within their nesting areas be maintained, yet nothing in the EIS seems to recognize that (see also Suring et al. 1993). Graham, et al. 1999, USDA Forest Service 2000b, Iverson et al. 1996, and Suring et al. 1993 are more examples of northern goshawk conservation strategies the FS might adopt for this Forest or Region, if emphasis was more appropriately placed on species conservation and insuring viability rather than justification for resource extraction.	#106	Response to Comment #106: The KNF is aware of this document for the management of goshawk habitat and has applied the associated habitat management guidelines in the past with a known goshawk nest territory. No new goshawk nesting territories were discovered during the Young Dodge analysis; therefore more specific habitat conservation methods were not applied. The FSEIS acknowledges the importance of Reynolds etal 1992 in the first paragraph on the goshawk analysis on page III-194.
USDA Forest Service 2000b recommends that forest opening greater than 50-60 acres be avoided in the vicinity of goshawks. At least five years of monitoring is necessary to allow for effective estimates of habitat quality (Id.). Research suggests that a localized distribution of 50% old growth should be maintained to allow for viability of goshawks (Suring et al. 1993).		
The scientific information provided in Center for Biological Diversity, 2004, also conflicts with the EIS's analyses and conclusions regarding goshawk viability, and includes vital information on goshawks missing from the DSEIS.		
Goshawks are often associated with a thick overstory cover and areas with a large number of large trees. For example, Hayward and Escano (1989) recommend an overstory canopy between 75 and 80%. According to the BE/BA for the Keystone Quartz EIS in the Beaverhead NF, "Goshawks prefer vegetation structure that permits them to approach prey unseen and to use their flight maneuverability to advantage (Widen, 1989, Beier and Drennan 1997)…" [14] Either that, or the KNF's goshawk habitat model is entirely useless for insuring viability. 57		

Opening forests by logging will increase suitability of species as the red-tailed hawk, which competes with goshawks, as well as the great horned owl, a goshawk predator. The problems of habitat conversion from that of goshawk to red-tailed hawk has been reported by La Sorte et al., 2004 based on a study of over 120 goshawk territories.

Clough (2000) noted that in the absence of long-term monitoring data, a very conservative approach to allowing logging activities near active goshawk nest stands should be taken to ensure that goshawk distribution is not greatly altered. This indicates that the full 180-acre nest area management scheme recommended by Reynolds et al. (1992) should be used around any active goshawk nest on the Forest. Removal of any large trees in the 180-acre nesting area would contradict the Reynolds et al. (1992) guidelines.

Greenwald et al., 2005 reviewed the current literature on goshawk habitat relationships applicable to the Northern Rockies. Nine of 12 studies demonstrated selection for stands with higher canopy closure, larger tree size, and greater numbers of large trees than found in random stands. Some notable statements and conclusions include:

> …Most studies found that goshawks avoided open areas and logged early-seral stands; none of the studies cited in this paper found selection for such features.
>
> …While some studies suffered from small sample sizes or relatively short sampling periods, the consistency of results demonstrates goshawk selection for late-successional forest structures (e.g., high canopy closure, large trees for forest type, canopy layering, abundant coarse woody debris) when using areas within their studied home ranges. … This is not to say that goshawks only forage or roost in mature stands, but rather that such stands are disproportionately selected.
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> … (R)eviewed studies found goshawks avoided open areas, particularly logged open areas, and none found selection for openings.
>
> … The 5 studies correlating nest occupancy and productivity with habitat features consistently demonstrated a relationship between closed-canopied forests with large trees and goshawk occupancy. Occupancy rates were reduced by removing forest cover in the home range, which thereby resulted in reduced productivity because there were fewer active breeding territories. (Internal citations omitted.)
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> Seeking to promote abundant populations of 14 prey species, Reynolds et al. (1992) recommend maintaining 20% of the landscape in grass–forb or seedling–sapling stage forest, 20% in young forest, 20% in mid-aged forest, and 40% in mature and old forests. … Given the above findings that goshawks generally avoid open areas and early-seral forest, that logging reduces goshawk occupancy and productivity, and a lack of evidence that creating openings or young forest through logging benefits goshawks, these recommendations appear to lack support in research produced since 1992.

Comment	#	Response
Across most of the western United States, mature and old-forests have declined to much less than 40% of the landscape. Given these declines and the lack of information on the amounts of mature and old-forest goshawks require, we recommend protecting existing mature and old-forest characteristics and ensuring that such forests are allowed to develop in proportions similar to presettlement conditions. This can be accomplished by restricting cutting to small trees, and prohibiting large reductions in canopy closure. A similar proposal was recently adopted by Region 5 of the United States Forest Service for the Sierra Nevada. In sum, based on apparent inconsistencies between subsequent research and Reynolds et al. (1992), we recommend adaptation of the management guidelines to incorporate results of numerous studies conducted since 1992. (Internal citations omitted.)		
The issue of fragmentation should have been more thoroughly considered with respect to goshawks. Other edge-adapted species may compete with the goshawk and displace the goshawk if inadequate amounts of interior forest habitat are available. Crocker-Bedford (1990) recommends that a foraging area of >5000 acres of dense forest, in which no logging is permitted, be designated for goshawks, with additional areas of 2500-5000 acres of more marginal habitat designated beyond this 5,000 acre foraging area.	#107	Response to Comment #107: The potential impacts from proposed alternatives are displayed in Goshawk Table 3-1 on page III-196. Likewise the discussion of direct, indirect and cumulative effects begins on page III-196 disclosing potential impacts and how past activities have impacted the availability of goshawk habitat. Newer science (Brewer etal 2009) indicates that goshawks use a more wide variety of habitat types and ages than previously thought.
The DSEIS failed to disclose and analyze the uncertain and precarious population status of the fisher, as described in Witmer, et al., 1998: The status of the fisher in the Western United States is poorly known but generally perceived as precarious and declining. This is a serious issue alone, but it also is a component of the larger problem of the decline of biological diversity. Recovery of species of concern must necessarily focus on the population level, because this is the scale at which genetic variation occurs and because population [sic] are the constituent elements of communities and ecosystems. Systematic habitat alteration and overexploitation have reduced the historical distribution of fishers in suitable habitat in the interior Columbia basin to isolated and fragmented populations. Current populations may be extremely vulnerable to local and regional extirpation because of their lack of connectivity and their small numbers (Id. at 14, internal citations omitted).	#108	Response to Comment #108: Analysis of the fisher is included on pages III-217-224 of the FSEIS.
The proposed logging could adversely impact fishers and their habitat. Habitat elements for natal and maternal dens are found in large diameter logs or snags, slated to be reduced by the logging. "Though the post-treatment stand condition would not be 'clear cuts', they would be fairly open and Jones (1991) did not expect to find substantial fisher hunting use of plantations by fishers until canopy approached 80% and 10-15 feet respectively (depending on snow depths)" (Flathead NF's Spotted Beetle EA, p. 3-62). The extensive logging, snag removal and other activities associated with the Young Dodge timber sale would negatively affect fisher habitat. Movement, denning, resting areas, genetic diversity, and other aspects of fisher life cycles and fisher survival could be impacted by the project; the FS does not fully consider these elements of the project or adequately mitigate their impacts.	#109	Response to Comment #109: All action alternatives under the Young Dodge proposal maintain at least 87% of the forest lands in either hiding or thermal cover following vegetation management activities (please see MIS Table 3-3; page III-185). While not all of these acres are considered primary fisher habitat, they do assist in fisher movement across the landscape and between areas of quality habitat along stream courses where an abundance of down wood and snags for denning can be found. The Young Dodge proposal also restricts harvest activities between February 15 and June 30 in units with close proximity (200 meters) to primary fisher habitat in order to reduce potential effects to this species during the breeding season (see Table 2-9 Management Requirements and Design Criteria). The analysis for fisher begins on page III-217 of the FSEIS.
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Jones (undated) provides an example of a possible conservation strategies for the fisher, something the FS has so far neglected to implement for this Sensitive species.

Regarding another Sensitive species, the black-backed woodpecker, Cherry (1997) states:

> The black-backed woodpecker appears to fill a niche that describes everything that foresters and fire fighters have attempted to eradicate. For about the last 50 years, disease and fire have been considered enemies of the 'healthy' forest and have been combated relatively successfully. We have recently (within the last 0 to 15 years) realized that disease and fire have their place on the landscape, but the landscape is badly out of balance with the fire suppression and insect and disease reduction activities (i.e. salvage logging) of the last 50 years. Therefore, the black-backed woodpecker is likely not to be abundant as it once was, and continued fire suppression and insect eradication is likely to cause further decline.

The Region 1 black-backed woodpecker assessment (Hillis et al., 2003) notes that the black-backed woodpecker depends upon dead and dying trees:

> Black-backed woodpeckers occupy forested habitats that contain high densities of recently dead or dying trees that have been colonized by bark beetles and woodborer beetles (Buprestidae, Cerambycidae, and Scolytidae). These beetles and their larvae are most abundant within burned forests. In unburned forests, bark beetle and woodborer infested trees are found primarily in areas that have undergone natural disturbances, such as wind-throw, and within structurally diverse old-growth forests. (Internal citations omitted.)
>
> …Black-backed woodpeckers also occur in unburned landscapes Bull et al. 1986, Goggans et al. 1987, Bate 1995, Hoffman 1997, Weinhagen 1998, Steeger and Dulisse in press, Taylor unpublished data). Taylor's observations of black-backed woodpeckers in unburned forests in northern Idaho suggest that they may occur at substantially lower densities in unburned forests, but no rigorous comparisons between black-backed woodpecker densities in burned and unburned forests have been done. Hutto (1995) hypothesized that black-backed woodpeckers reproduce at *source* reproductive levels in burns, but may drop to *sink* reproductive levels in the intervening periods between large burns.

Dolan (1998a,b) states in regards to impacts on the black-backed woodpecker due to fire suppression and post-fire logging states:

> It seems that we have a huge cumulative effects problem here, and that each salvage sale removes habitat that is already very limited. We are having trouble avoiding a "trend to federal listing" call for the BBWO in salvaging burns, unless comparable acres of fire-killed dead are being created through prescribed burns.

The comments by other biologists attached to Dolan, 1998a,b reveal that the FS has yet to design a consistent, workable, scientifically defensible strategy to ensure viable populations of the black-backed woodpeckers. The fire suppression and "salvage" logging policies of the KNF are the biggest threat to black-backed woodpecker population viability on the Forest, unfortunately in failing to create a conservation strategy the cumulative impacts of the KNF's ongoing fire suppression policy will remain unexamined. The Young Dodge timber sale continues an unspoken management for extinction policy.

Lofroth (1997) in a British Columbia study, found that wolverines use habitats as diverse as tundra and old-growth forest. Wolverines are also known to use mid- to low-elevation Douglas-fir forests in the winter (USDA Forest Service, 1993). The cumulative impacts of logging and road building on a species that depends upon remote, wild areas are ignored in this DSEIS. #110

The flammulated, boreal owl and the great gray owl are species of concern that are sensitive to logging and other management activities. The KNF provides inadequate management strategies to insure their viability. See, for example, Hayward and Verner, 1994. #111

Wright, et al. (1997) point out that habitat restoration for the flammulated owl must be carefully targeted to the correct habitat types. The FS can't simply cut and/or burn forest land and expect flammulated owls to start using it as habitat. Wright, et al. (1997) state: #112

> (W)e never detected Flammulated Owls in mesic old-growth ponderosa pine stands with a Vaccinium understory. Thus, within suitable landscapes, it may be most effective to conserve and restore stand structural characteristics within suitable habitat types (e.g., xeric ponderosa pine/ Douglas-fir stands in our study area), rather than within any stand containing ponderosa pine trees.

The DSEIS does not adequately consider cumulative effects on upland habitat for boreal toads. This does not make sense, since such small populations that are likely to persist are especially susceptible to fragmentation and extirpation due to isolation of smaller populations. See Maxell, 2000. In fact, the DSEIS has no genuine analysis of cumulative impacts of logging activities on boreal toads at all. #113

From Ch. 3 p. 173 of the Bristow Area Restoration Project EA, Kootenai National Forest, (USDA Forest Service, 2003a:

> Little quantitative data are available regarding the boreal toad's use of upland and forested habitats. However, boreal toads are know to migrate between the aquatic breeding and terrestrial nonbreeding habitats (TNC Database 1999), and that juvenile and adult toads are capable of moving over 5 km between breeding sites (Corn et al. 1998[15]). It is thought than juveniles and female boreal toads travel farther than the males (Ibid). A study on the Targhee National Forest (Bartelt and Peterson 1994) found female toads traveled up to 2.5 kilometers away from water after breeding, and in foraging areas, the movements of toads were significantly influenced by the distribution of shrub cover. Their data suggests that toads may have avoided macro-habitats with little or no canopy and shrub cover (such as clearcuts). Underground burrows in winter and debris were important components of toad selected micro-sites in a variety of macro-habitats. The boreal toad digs its own burrow in loose soil or uses those of small mammals, or shelters under logs or rocks, suggesting the importance of coarse woody debris on the forest floor. …(T)imber harvest and prescribed burning activities could impact upland habitat by removing shrub cover, down woody material, and/or through compaction of soil.

[15] Cited and included as Maxell et al., 1998 herein.

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Response to Comment #110: The wolverine is analyzed on pages III-241-246 of the FSEIS.

Response to Comment #111 and #112: Flammulated owl and its habitat are addressed in the FSEIS beginning on page III-224. Surveys for this species were conducted within the Young Dodge planning boundary in suitable habitat in order to avoid direct impacts on this species. No flammulated owls were found during the surveys. Outside of the proposed regeneration treatments, areas where improvement treatments and prescribed burning are proposed can be beneficial for this species. The FSEIS specifically discloses the anticipated impacts of this proposal on flammulated owls as a species listed as sensitive for the KNF. The data sources, methods and assumptions for the analysis on flammulated owls are disclosed on page III-224of the FSEIS. Potential impacts on other owl species such as the great gray owl and boreal owl are closely tied to the analysis for old growth which begins on page III-155 of the FSEIS.

Response to Comment #113: The FSEIS provides a cumulative effects analysis and summary of the existing condition which takes into consideration past timber harvest and road building activities and their impacts on boreal toad habitat beginning on page III-235 and specifically discloses the effects on toad habitat from these same activities on page III-235. Being more terrestrial generalists, the boreal toad has likely been impacted more from extended drought conditions experienced the past ten years which has reduced quality breeding sites, the spread of disease such as the chytrid fungus (*Batrachochytrium dendrobatidis*), and habitat alteration due to farming and housing developments that destroy wetlands (Werner etal 2004).

Montana Fish, Wildlife & Parks, 2005 (a more recent version of the above cite "TNC Database, 1999") also discuss boreal toad habitat:

> Habitats used by boreal toads in Montana are similar to those reported for other regions, and include low elevation beaver ponds, reservoirs, streams, marshes, lake shores, potholes, wet meadows, and marshes, to high elevation ponds, fens, and tarns at or near treeline (Rodgers and Jellison 1942, Brunson and Demaree 1951, Miller 1978, Marnell 1997, Werner et al. 1998, Boundy 2001). Forest cover in or near encounter sites is often unreported, but toads have been noted in open-canopy ponderosa pine woodlands and closed-canopy dry conifer forest in Sanders County (Boundy 2001), willow wetland thickets and aspen stands bordering Engelmann spruce stands in Beaverhead County (Jean et al. 2002), and mixed ponderosa pine/cottonwood/willow sites or Douglas-fir/ponderosa pine forest in Ravalli and Missoula counties (P. Hendricks personal observation).
>
> Elsewhere the boreal toad is known to utilize a wide variety of habitats, including desert springs and streams, meadows and woodlands, mountain wetlands, beaver ponds, marshes, ditches, and backwater channels of rivers where they prefer shallow areas with mud bottoms (Nussbaum et al. 1983, Baxter and Stone 1985, Russell and Bauer 1993, Koch and Peterson 1995, Hammerson 1999). Forest cover around occupied montane wetlands may include aspen, Douglas-fir, lodgepole pine, Engelmann spruce, and subalpine fir; in local situations it may also be found in ponderosa pine forest. They also occur in urban settings, sometimes congregating under streetlights at night to feed on insects (Hammerson 1999, P. Hendricks personal observation). Normally they remain fairly close to ponds, lakes, reservoirs, and slow-moving rivers and streams during the day, but may range widely at night. Eggs and larvae develop in still, shallow areas of ponds, lakes, or reservoirs or in pools of slow-moving streams, often where there is sparse emergent vegetation. Adult and juvenile boreal toads dig burrows in loose soil or use burrows of small mammals, or occupy shallow shelters under logs or rocks. At least some toads hibernate in terrestrial burrows or cavities, apparently where conditions prevent freezing (Nussbaum et al. 1983, Koch and Peterson 1995, Hammerson 1999).

Maxell et al., 1998 state:

> We believe that the status of the Boreal toad is largely uncertain in all Region 1 Forests. ....Briefly, factors which are a cause for concern over the viability of the species throughout Region 1 include: (1) a higher degree of genetic similarity within the range of Region 1 Forests relative to southern or coastal populations; (2) a general lack of both historical and current knowledge of status in the region; (3) indications of declines in areas which do have historical information; (4) low (5-10%) occupancy of seemingly suitable habitat as detected in recent surveys; (5) some evidence for recent restriction of breeding to low elevation sites and; (6) recent crashes in boreal toad populations in the southern part of its range which may indicate the species' sensitivity to a variety of anthropogenic impacts.

Forest Plan population viability/MIS standard 3.c. requires "(m)aintaining a variety of unit sizes of generally 40 acres or less. Where catastrophic conditions such as insects, disease, or fire creates a condition whereby larger unit sizes will have no additional effect on the wildlife habitat, larger cutting units may be used." (Forest Plan at II-23.) Nothing in the DSEIS shows that the larger unit sizes in Alternative 1-Modified would have "no additional effect" on big-game species, other management indicator species, or threatened, endangered, and sensitive species. The project area already contains a lot of large 40+ acre openings, and the cumulative impacts on wildlife because of those and the new proposed large openings is not adequately analyzed nor disclosed. #114

IX. INADEQUATE ASSESSMENT OF WATER QUALITY AND FISHERIES HABITAT

Yet another glaring omission from its discussions of "reference conditions" are the population levels and distribution of TES fish species, the westslope cutthroat trout and bull trout. How have these populations fared, following approximately 274 miles of roads in the project area, all the hydrologically altered soil conditions, and reductions in canopy closure via logging, burning, and road construction? Since those developments are, again, antithetical to "reference conditions" this would clearly be another critical "Ecological Factor." #115

The DSEIS presents data on fish habitat conditions over a similar time frame, reflecting conditions only after decades of heavy logging and road building in Young and Dodge Creeks, again not descriptive of "reference conditions." #116

The DSEIS fails to provide high quality information based on up-to-date stream condition and aquatic species' habitat condition surveys consistent with NEPA and NFMA. The DSEIS also presents little or no data on baseline (prior to "management) conditions, preferring to use the presently-damaged status (following decades of cumulative management impacts) as baseline.

As a legal matter, the FS's obligations under both the Clean Water Act (CWA) and NFMA are clear and beyond dispute. The agency must protect water quality and comply with state water quality standards on National Forest system lands. *Marble Mountain Audubon Soc. v. Rice*, 914 F.2d 179, 182 (9th Cir. 1990); *Oregon Natural Resources Council v. U.S. Forest Service*, 834 F.2d 842, 848 (9th Cir. 1987); *Northwest Indian Cemetery Protective Ass'n v. Peterson*, 794 F.2d 688, 697 (9th Cir. 1987); 33 U.S.C. 1323(a) ("Each department, agency, or instrumentality of the executive [branch] . . . shall be subject to, and comply with, all Federal, State, interstate, and local requirements, administrative authority, and process and sanctions respecting the control and abatement of water pollution"); NFMA at 16 U.S.C. 1604(g)(3)(E)(iii) (timber may be harvested only where "protection is provided for streams, streambanks shorelines, lakes, wetlands, and other bodies of water from detrimental changes in water temperatures, blockages of water courses, and deposits of sediment"); NFMA regulations at 36 C.F.R. 219.23(d) ("Forest Planning shall provide for -- Compliance with requirements of the Clean Water Act, the Safe Drinking Water Act, and all substantive and procedural requirements of Federal, State and local governmental bodies") and at 219.27(a)(4) ("All management prescriptions shall . . . Protect streams, streambanks, shorelines, lakes, wetlands and other bodies of water"). #117

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Response to Comment #114: The rationale for the development of Alternative 1-Modified is described on page II-20 of the FSEIS. Alternative 1M alters the prescriptions of several treatment units to a more conservative prescription (more leave trees) as well as drops unit 129. Alternative 1M also reduces the number of openings greater than 40 acres from 17 (Alt 1) to 15 in Management Area 12 and maintains a higher cover to forage ratio than either Alt 1 or Alt 3 (MIS Table 3-3, p. III-185). Given this information, Alternative 1M has slightly less effects on resident wildlife species, including listed species. The effect of Alternative 1M on various wildlife resources is given under each individual resources or species discussed. Some of the rationales for proposing treatment units greater than 40 acres are to reduce the overall edge effect created by multiple past harvest units systematically laid out on the landscape, to create a more visually pleasing vegetative pattern, and to create larger areas of interior forest for the future. Approval for utilizing harvest units over 40 acres to accomplish these proposals comes from the Northern Regional Office.

Response to Comment #115: CEQ Implementing Regulations (§ 1500) do not require a discussion of reference conditions for any resource. A discussion of the affected environment including existing conditions and trends within the Analysis Area are covered on pages III-144 through III-147. MAP 3-8 displays fish distribution within the Analysis Area.

Response to Comment #116: The FSEIS presents habitat data from multiple survey years for both Young and Dodge Creeks on pages III-139 and III-141. The latest survey data was collected in 2006. No additional data was collected between the DEIS and DSEIS, however, data was collected during the summer of 2010. This data has not been analyzed at this time. There is no data available on conditions prior to management.

Temperature data and discussion are found on page III-142. Further temperature discussions and anticipated effects from different activities can be found in Volume 4 Documents 22 through 25 of the Project File.

Response to Comment #117: That is correct; the agency must comply with local, state, and federal law, regulation, and policy. Pages III-137 to 138 and 153 to 154 of the FSEIS discloses the Forest Service's consistency with regulatory framework. Both DEQ and EPA have reviewed the project and have not indicated that the project is out of compliance.

Elevated peakflows contribute to downstream flooding and increase the magnitude and extent of flood damage. Elevation of downstream flows also increases downstream channel erosion and sediment transport. Even relatively slight increases in downstream flooding greatly increase downstream erosion and sediment transport because they are exponentially related to streamflow (King, 1989).

#118

Rain-on-snow events can lead to further stream channel degradation, due to the large increases in runoff over a short time. Massive sediment delivery to the system occurs during high discharge events typically associated with rain-on-snow conditions. The DSEIS fails to adequately consider the effects of these weather-related instantaneous peak flow events, as they interact with the heavily logged and roaded conditions of the project area watersheds.

#119

The DEIS states, "Currently all of the watersheds in the Analysis Area meet Forest Plan Standards for peak flow increases." (DEIS at III-73.) TLC's DEIS comments stated, "The DEIS fails to disclose what exactly those Forest Plan Standards are!"

#120

In response: the KNF stated: "Forest Plan Standards for peak flow increases are displayed in Water Table 3-4 DEIS page III-78." That DEIS table is reproduced below.

Water Table 3-4. Changes in Peak Flow by Alternative (% PFI)

Watershed	Historic PFI Range	Forest Plan PFI Range	Existing PFI	Alt. 1 PFI	Alt. 2 PFI	Alt. 3 PFI
Dodge Creek	2-23	10-20	11	16	11	15
Young Creek	4-27	10-20	10	13	10	12

Now we refer to page 17 of the WKER Project Supplemental EA (Appeal Attachment 4). The text in and around its Table 2 is reproduced below:

Once the RPFI thresholds were established, the R1-WATSED model was run to determine how the projected PFI from proposed activities for the streams in the Analysis Area compared to the recommended levels. The results of the model runs are shown in Table 2, below:

Table 2. Cumulative Peak Flow Increase for West Kootenai Ecosystem Restoration Project

Watershed	Existing Condition Peak Flow Increase*	Recommended Peak Flow Increase	Peak Flow Increase (and Increase from Existing Level)**
Dodge Creek	11%	13%	11% (0%)
Young Creek	13%	13%	13% (0%)
Poverty Creek	6%	14%	8% (2%)
Tooley Lake	6%	18%	8% (2%)

* Existing PFI is reflective of the No Action Alternative.

So back in 1999, the "Recommended Peak Flow Increase" for both Young and Dodge Creeks was 13%, but the Young Dodge EIS amended these "Forest Plan Standards" to 20%—without the use of the NEPA/Forest Plan Amendment Process? Of course, with Alternative 1 resulting in

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Response to Comment #118: Rain-on-snow and other instantaneous runoff events are discussed in the FSEIS on Page III-113, 115, and 116. For additional information regarding stream flow, refer to the following in the Soil and Water Project File:

KNF Revised Hydraulic Guide 1990
Hoffman 1993 – Hydro-climatic Analysis of Peak Flows in Northwest Montana
MacDonald et al 1997 – Validation of Water Yield Thresholds on the KNF
R1-WATSED/Water Yield Process Documentation

The Revised Hydraulic Guide, MacDonald et al and Hoffman identify this portion of the KNF as seldom being influenced by rain-on-snow events. It is true that some of the highest flows of record in many watersheds of Northwest Montana were caused by rain-on-snow events, however the frequency of these events in the Project Area is very low compared to other areas of the Forest.

Response to Comment #119: This comment and the page numbers cited refer to the DEIS, not the DSEIS. Forest Plan Standards are discussed in the FSEIS on Pages III-110 and 111.

Response to Comment #121: This comment and the page numbers cited refer to the DEIS not the DSEIS.

The FSEIS discusses, in detail, the concern raised by the commenter (Pages III-120-122). It is important to note that the percentages discussed with regard to peak flows are guidelines and do not need a Forest Plan Amendment to be changed. In addition, the guidelines in Appendix 18, Volume II of the Forest Plan do not say that the percentages put forth at a given time are static. The PFIs are based on the current stability/conditions of the stream and can be adjusted ± 2% based on instream values.

The concerns the commenter had about PFIs in the DEIS have been alleviated in the FSEIS because of 4 years of additional watershed recovery, reduction in management activities associated with the alternatives, and changed prescriptions (FSEIS, Water Table 3-5, Page III-122).

a violation of the previous 13% Standard—up to 16%—it's clear why the FS felt it had to try to slip this one past the public. In order to achieve the Young Dodge "desired conditions" that include clearcut opening sizes not normally allowed by NFMA and the Forest Plan the Standard would have to be violated. The FS will likely say that the numbers are not meant to be taken as exact, etc. Which is what we've been saying all along—both in commenting on the original WKER Project EA, and this in TLC's Young Dodge DEIS comments: The DEIS relies upon a Peak Flow analysis to suggest that the current Water Yield conditions are reasonably comparable to "reference conditions" such that significant impacts on streams from past actions has not occurred. Since modeled numbers and other statistics for peak flows are only estimates whose valid uses can only include comparison purposes, the amount of error in all statistics should be disclosed to shed light on the real meaningfulness of differences in the figures. It is possible that differences may be mostly or entirely error. Statistically, error should best be expressed by the use of confidence intervals. In fact, the KNF did respond: Water yield interpretations are made based on PFI trends and relative differences between alternatives, and do not require nor assume that the values are precise. DEIS page III-77 states "R1-WATSED was not designed, nor is it used, to develop exact estimates of flows. The utility of the model is that it gives us a consistent method of comparing alternatives to each other, as well as to modeled natural conditions." So in effect, the KNF recognizes **no limits** on the level of water yield increases created by its logging and roading activities, because all it has to do is play games with the numbers.		
The DSEIS's watershed analysis relies on Equivalent Clearcut Acres (ECAs) and the Northern Region's WATSED model to estimate the increased water yield from logging. WATSED consistently underestimates the effects of logging and roads on peak flows. USDA Forest Service, 2001b concedes that the FS's own data indicate that WATSED consistently underestimates monthly peak flows by 3-13%. The Fortine EIS, Fortine RD, KNF, 2004, at p. 3-75) states that "Peak flow increases resulting from forest management activities are important because peak flows provide the maximum energy for erosion, transport, and deposition of sediment in stream channels." The DSEIS fails to incorporate this fact in its discussion of likely effects on flows within the project area and downstream. The ECA model's consistent underestimation of monthly peakflows is never discussed in the context of the alternatives' effects on channel conditions and processes and aquatic habitat and fish populations.	#121	Response to Comment #121: The FSEIS discusses the potential and predicted effects from increases in PFIs on Pages III-111-112, 112-113, 115-117, and 120-122.
The DSEIS also wholly ignores and fails to disclose the agency's own research (King, 1989) on the accuracy of a peakflow model, similar to the ECA method, in estimating increases in peakflows from logging and roads in nearby northern Idaho. King (1989) examined the veracity 65	#122	Response to Comment #122: The FSEIS discusses the methods, assumptions, and limitations of stream flow monitoring on Pages III-111 to 113. King 1989 is cited in the FSEIS on Page III-115. Additional information with regard to modeling peak flow can be found in the document titled R1-WATSED/Water Yield Process Documentation in the Soil and Water Project File. However, while the FSEIS displays the results of modeling it does not rely solely on them (Water Table 3-5, Page III-122). The true indicator of the cumulative effects to the watershed that result from management activities is the stream conditions within the watershed. There are 10+ years of stream monitoring data displayed in the FSEIS (Pages III-114 to 120). The monitoring data for Young and Dodge Creeks show both streams as being stable and in good condition.

of a model for changes in peakflow as a function of ECA. He found that the ECA model consistently underestimated measured increases in flow caused by roads and logging.

The ECA model outputs are also inadequate to disclose the effects of the alternatives and cumulative effects on peakflows and resultant impacts on aquatic resources. The DSEIS fails to disclose that King (1989) clearly noted that estimates of average monthly peakflows triggered by logging and roads are not adequate for estimating likely changes in channel conditions and sediment transport caused by logging and roads. King (1989) noted:

> …the largest 7 or 8 days of streamflow account for the majority of the bedload movement…Average monthly streamflows are usually not a good index of bedload transport, and 'changes in average annual monthly peakflows have no meaningful effect on sediment transport' (Megahan, 1979) and are thus poor indicators of changes in channel-forming flows.

In his research in nearby northern Idaho, which is clearly relevant to the project area, King (1989) also stated:

> Thus, it is the relatively few **high flow days** that have the potential for shaping the channel. Increases in **short duration high flows** following harvesting and road building are more important in terms of potential channel erosion and bedload transport than increases in longer duration high flows such as the **maximum mean monthly streamflows**… (emphasis added).
>
> Therefore, increases in short-duration highflows are more important than longer duration highflows in shaping the channel, and any procedure to estimate streamflow responses and set limits on harvesting should focus on these shorter duration highflows.

As the Trego DN admitted, the R-1 WATSED peak flow models average annual peak flows, not peak flows resulting from extreme events (Appendix 5-34). Yet as we've indicated by our cites of "best available science" it is storm events that cause the most damage from peak flows elevated due to roads, impervious soils or semi-impervious soils, and forest canopy reduction from logging. **This is precisely the point; those events are when much damage occurs, yet the FS has no way of modeling or estimating such damage, and the NEPA analysis thus downplays the issue.**

Skid trails in units are to be used repeatedly, in fact favored with each entry. This is also reflected in Forest Plan Objectives:

> When it is determined that equipment operation is a hazard to soil productivity the project plan shall: …establish a standard for how much of the project area will be allocated to skid trails, landings, temporary roads or similar areas of concentrated equipment travel. The standard shall minimize the area allocated to those uses to the extent practical. (Forest Plan at II-7).

Such dedicated skid trails represent long-term cumulative effects, as impervious or semi-impervious soils that result in increased and unnatural runoff, which logically must be analyzed

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#123

Response to Comments #123: The FSEIS considers the impacts of semi-impervious soils in the Water analysis (Pages III-108 to 136). Peak flow modeling includes increased runoff factors for disturbed areas such as harvest units and roads. The analysis of changes in peak flow can be found on Pages III-120 to 122 of the FSEIS. Cumulative effects to peak flows resulting from past, present, and reasonably foreseeable activities can be found on Pages III-126 to 134 of the FSEIS. The true indicator of the cumulative effects to the watershed that result from soil disturbance is the stream conditions within the watershed. There are 10+ years of stream monitoring data displayed in the FSEIS (Pages III-114 to 120). The monitoring data for Young and Dodge Creeks show both as being stable and in good condition.

and disclosed in watershed-level or subwatershed-level cumulative effects analyses. This was not done for the DSEIS.

Although the DSEIS fails to disclose or discuss these important conclusions from the FS's own research, which are directly relevant to the Young Dodge timber sale's likely impacts, King (1989) clearly indicates that DSEIS-type estimates of effects from increased peakflows is inadequate for determining the cumulative effects and resultant impacts on channel erosion, bedload transport, sedimentation, bank erosion, fish habitat, fish survival, and downstream flooding impacts.

The DSEIS's analysis of changes in monthly peakflow is not a surrogate for estimates of daily and instantaneous peakflows triggered by the alternatives and in combination with the cumulative effects of the existing road network and past logging. These peakflow attributes, which are ignored in the DSEIS, are most important for determining the likely effects on channels and sediment transport triggered by logging and roads (King, 1989). Average peakflow increases are not of greatest concern. Sediment transport and channel change are greatly affected during extreme events. This is especially the case since the streams have already been sensitized to increased peakflows due to the effects of past logging and road building in the watershed.

#124

The DSEIS fails to disclose that the KNF has, in the context of monitoring as the Forest Plan and NFMA require, found that it has systematically and chronically been unable to adhere to its Forest Plan Water Yield guidelines. The analysis in the DSEIS fails to disclose that many of the methodologies it utilizes have been declared—by KNF experts themselves—to be inadequate for the purposes of analyzing cumulative impacts in the project area.

#125

One of the important facts that the DSEIS fails to disclose is that the ECA model and Water Yield guidelines used for water quality cumulative effects analyses have never been validated for their expressed purposes of maintaining water quality and fisheries habitats. According to the KNF's "Draft Five-Year Review and Evaluation Report (Fiscal Years 1988-1992), August 1993," KNF experts concluded that:

> We're not meeting the Forest Plan Monitoring requirements for Item F-3 which means that we'll be ***unable to calibrate and/or validate the water yield guidelines***. The Monitoring Plan variability limits are being exceeded. There is more difficulty in meeting timber sell targets as a result…***Over 1.5 million acres were analyzed… 400,00 acres (24%) were beyond the Plan's guidelines for an allowable water yield increase…***"

(Emphasis added.) The DSEIS fails to disclose to the public many other problems that previous monitoring efforts have revealed of Forest Plan implementation. Such problems, also thus far omitted from all KNF Project NEPA documents such as the Young Dodge DSEIS include:

> …no tracking of changes in Stream Channel Stability comparing pre- and post-harvest conditions have been performed… ***We're not meeting FPMI F-3 requirements, and we're unable to calibrate and/or validate the water yield guidelines***… Funding mechanisms are not set up to monitor post-harvest Stream Channel Stability conditions and evaluate the results. The combination of current workloads/qualified personnel does not allow post-harvest Stream Channel Stability

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Response to Comment #124: The analysis of changes in peak flow can be found on Pages III-120 to 122 of the FSEIS. Cumulative effects to peak flows resulting from past, present, and reasonably foreseeable activities can be found on Pages III-126 to 134 of the FSEIS. In addition, for those effects that peak flow modeling does not address, like sediment and the rerouting of water, road density and road BMP analysis was conducted (FSEIS, Pages III-120 to 125, and Pages III-132 to 135). The true indicator of the cumulative effects to the watershed that result from soil disturbance is the stream conditions within the watershed. There are 10+ years of stream monitoring data displayed in the FSEIS (Pages III-114 to 120). The monitoring data for Young and Dodge Creeks show both as being stable and in good condition. The potential for management activities to affect higher intensity runoff is discussed specifically on Page III-112 of the FSEIS. Additional information can be found in the Water Specialist Report in the Soil and Water Project File.

Response to Comment #125: The FSEIS discloses a summary of the analysis methods, assumptions, and limitations of ECA/WATSED modeling on Pages III-112-113. Additional information can be found in the Water Specialist Report and R1-WATSED/Water Yield Process Documentation in the Soil and Water Project File.

> evaluations. The Stream Channel Stability evaluation is not precise or reliable enough of a tool to determine if a 20% change has occurred, or to validate the peakflow models… Four out of the six Districts have more than 5% of their sampled acreage exceeding the Water Yield Guidelines. The problem is controversial because the current Water Yield Guideline sets an upper limit on the amount of timber harvest and road construction that can occur in any watershed.

((FOIA Exempt – Deliberative Process, Monitoring Item Writeups from 5-Year Review Meeting 3/31/-4/1/93, emphasis added.) According to KNF interpretations of its Forest Plan:

> [Monitoring Item F-3] was established to help ensure that flow increases from past and proposed forest management activities did not lead to stream channel degradation. Any stream channel degradation or reductions in beneficial uses as a result of Forest Plan management activities would be a violation of State Water Quality Standards, and the Memorandum of Understanding (MOU) between the Forest Service and the Montana Department of Health and Environmental Sciences (Water Quality Bureau)…The original FPMI intent was to track two separate items: a) changes in Stream Channel Stability from various levels of projected peak flow increases; and b) the percentage of watersheds that were analyzed that had peak flow increases exceeding current guidelines. Further action was to be initiated when either Stream Channel Stability degraded at least 20% from pre-management conditions, or if 20% of the watersheds exceeded the peakflow guidelines.

["FOIA Exempt – Deliberative Process, Kootenai National Forest, Forest Plan 5-Year Review Report" (July, 1993).] According to the KNF, during the first five years of KNF Plan implementation, the results of Monitoring Item F-3 revealed "398,600 acres of the KNF (combined public and private land) in a condition that exceeds the desirable water yield limits. This is about 26% of the KNF (combined public and private land) and beyond the 20% prescribed level in the M & E Plan." (FOIA Exempt – Deliberative Process … Monitoring Item Writeups from 5-Year Review Meeting 3/31/-4/1/93.)

Also, according to a "Watershed Condition Assessment" conducted by the KNF:

> A preliminary assessment of 750 watersheds covering about 2,706,000 acres of both public and private lands indicates that about 12% of the watersheds (366,000 acres) are beyond the acceptable thresholds. Another 29% is at or close to the thresholds (786,000 acres).

["FOIA Exempt – Deliberative Process, Kootenai National Forest, Forest Plan 5-Year Review Report" (July, 1993).] Due to these poor results, according to the KNF, the Forest Plan Monitoring Item F-3 was rated:

> Out-of-Compliance, based on the number of acres and watersheds analyzed for water yield increases, and the number that exceed Forest Plan standards and guides. A portion of the FPMI resulted in an Inconclusive rating because no tracking of changes in Stream Channel Stability comparing pre- and post-harvest conditions have been performed… ***We're not meeting FPMI F-3 requirements, and we're unable to calibrate and/or validate the water yield guidelines***… Funding mechanisms are not set up to monitor post-harvest Stream Channel Stability

conditions and evaluate the results. The combination of current workloads/qualified personnel does not allow post-harvest Stream Channel Stability evaluations. The Stream Channel Stability evaluation is not precise or reliable enough of a tool to determine if a 20% change has occurred, or to validate the peakflow models… Four out of the six Districts have more than 5% of their sampled acreage exceeding the Water Yield Guidelines. The problem is controversial because the current Water Yield Guideline sets an upper limit on the amount of timber harvest and road construction that can occur in any watershed. (Id., emphasis added.) According to KNF experts, the purpose of Forest Plan Monitoring Item F-2 was "to document the protection of fishery habitat" by measuring bedload and suspended sediment and streamflow on seven drainages: A threshold of an increase of 20% or more in the sediment was a basis to initiate further action. It was assumed that if the condition of these seven streams did not deteriorate during prescribed Forest Plan management, than conditions were probably acceptable forestwide. ["FOIA Exempt – Deliberative Process, Kootenai National Forest, Forest Plan 5-Year Review Report" (July, 1993).] According to these experts' conclusions on the sediment impacts to fisheries related to timber harvest under the KNF Plan: Forest Monitoring Item F-2 is not being implemented because of overlap with Monitoring Item F-1. Because of this ***we're not able to show adequate information to other agencies and the public that, yes, we are protecting beneficial uses. We're not sure we're meeting Forest Goal #19 (meet or exceed State Water Quality standards)***… State and Federal agencies feel we're not meeting our legal mandates under the Clean Water Act or Montana Water Quality Law as long as we can't prove that we're protecting beneficial uses… ["Draft Five-Year Review and Evaluation Report (Fiscal Years 1988-1992)" (August 1993); emphasis added.] WATSED and ECA estimates of peakflow changes do not address changes in daily and instantaneous peakflows from rain-on-snow events caused by logging and roads. Flooding and rain-on-snow events occur in the project area. Rain-on-snow events during the winter and spring months have been found to cause peak flows in the area (MacDonald and Hoffman, 1995). Hoffman, 1993 performed a study finding that rain-on-snow events were significant in the Big Creek watershed, a nearby area in the KNF. The DSEIS fails to disclose the limitations of the ECA modeling/analysis procedure. The expected levels of precision, amount of error, omissions of relevant factors—all are important for understanding how complex hydrological processes can be simplified and summarized in any meaningful way for analysis purposes. For example, WATSED's limitations are listed on page D-2 of USDA Forest Service, 2001b and read as follows: **Model Limitations:** WATSED estimates cumulative effects based on the average, measured response of the watersheds used to develop the model. Different watersheds respond differently 69	#126	**Response to Comment #126:** The FSEIS discloses a summary of the analysis methods, assumptions, and limitations of ECA/WATSED modeling on Pages III-111 to 113. Additional information can be found in the Water Specialist Report and R1-WATSED/Water Yield Process Documentation in the Soil and Water Project File.

to stress due to a vast number of climatic and environmental factors (Brooks and others 1991, Troendle and King 1985, Megahan 1983, Christner and Harr 1982). WATSED cannot account for the multitude of factors that cause variability among watersheds. Therefore, it uses simplified rules and assumptions set by the author (Patten 1989, Patten 2000, USFS (unpubl)). As a result, WATSED outputs should not be interpreted as measured values from the watershed being analyzed. Natural variability, technical limitations, measurement error, and model limitations must be considered when interpreting hydrologic models (Harr 1986, Thomas and Megahan (1998)). For example,

- WATSED assumes that a road prism stays open and maintained to perpetuity. Many forest roads are little used and heavily re-vegetated. This model limitation would tend to result in overestimates of sediment yield.
- WATSED does not explicitly evaluate the risk of stream crossing failure, which is a major factor in sediment risk in the Coeur d'Alene River. This model limitation tends to result in underestimates of the bedload component of sediment yield. (An additional Risk Analysis procedure is used for evaluating stream crossings).
- Natural resilience to disturbance. Low-level changes in sediment yield and peak flow do not usually cause measurable changes in stream condition unless they are sustained for long periods of time (Patten 2000).

USDA Forest Service, 2001b (p. D-3) admits that because of model error, measurement error, and natural variability and resulting differences between WATSED estimates and actual values peak flows and sediment yield, WATSED results should be interpreted as relative indicators of watershed response rather than absolute predictors of flow; the WATSED model is useful for evaluating watershed condition and comparing management alternatives, but it does not provide accurate estimates of flow. Similarly, in response to comments the DSEIS still did not disclose shortcomings in evaluating in-channel and stream-bank erosion, sediment and water discharge from rain-on-snow events, or the effects of other large destructive events. #127

The estimates of changes in monthly average peakflow caused by the alternatives are not given as a possible range of real vales with their range of real environmental effects. The DSEIS is devoid of a discussion of impacts of changes in peakflows on aquatic resources based on entirely reasonable assumptions that: #128

a) model underestimates of effects on average monthly peakflows, and;
b) impacts on daily and instantaneous peakflows are likely to be greater than indicated by model estimates.

Even very small changes in peakflow can have significant impacts on channel erosion and sediment transport, because they are exponentially affected by streamflow (King, 1989). For these reasons, even small and, possibly immeasurable increases in peakflows have significant impacts on channels, fish habitat, and sediment transport within Project Area rivers and tributaries. Again, this is especially the case since the streams have already been sensitized to increased peakflows due to the effects of past logging and road building in the watershed.

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Response to Comment #127: The DSEIS discloses a summary of the analysis methods, assumptions, and limitations of ECA/WATSED modeling on Pages III-111 to 113. Rain-on-snow and other instantaneous runoff events are discussed in the DSEIS on Page III-113, 115, and 116. For additional information regarding stream flow, refer to the following in the Soil and Water Project File:

KNF Revised Hydraulic Guide 1990
Hoffman 1993 – Hydro-climatic Analysis of Peak Flows in Northwest Montana
MacDonald et al 1997 – Validation of Water Yield Thresholds on the KNF
R1-WATSED/Water Yield Process Documentation

The Revised Hydraulic Guide, MacDonald et al and Hoffman identify this portion of the KNF as seldom being influenced by rain-on-snow events. It is true that some of the highest flows of record in many watersheds of Northwest Montana were caused by rain-on-snow events, however the frequency of these events in the Project Area is very low compared to other areas of the Forest. The potential for management activities to affect higher intensity events is discussed specifically on Page III-112 of the FSEIS.

Response to Comment #128: The analysis of changes in peak flow can be found on Pages III-120 to 122 of the FSEIS. Cumulative effects to peak flows resulting from past, present, and reasonably foreseeable activities can be found on Pages III-126 to 134 of the FSEIS. Rain-on-snow and other instantaneous runoff events are discussed in the FSEIS on Page III-113, 115, and 116. For additional information regarding stream flow, refer to the following in the Soil and Water Project File:

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Since watersheds already exceed limits considered acceptable and fail to meet all Riparian Management Objectives (RMOs), the ECA modeling procedure cannot be relied upon as the Young Dodge analysis does. This is reinforced in the three KNF memos that were included as Attachment 1 of our 11/29/2004 administrative appeal of the Fortine Ranger District's Fortine Project Record of Decision.

Since modeled numbers and other statistics for peak flows are only estimates whose valid uses can only include comparison purposes, the amount of error in all statistics should be disclosed to shed light on the real meaningfulness of differences in the figures. It is possible that differences may be mostly or entirely error. Statistically, error should best be expressed by the use of confidence intervals.

According to KNF experts, in implementing the KNF Plan:

> It's not clear as to when or under what conditions State Water Quality Standards are not [being] met. It's inferred that failure to achieve 100% implementation of the BMP's [Best Management Practices] means that the State Water Quality management requirements have not been met… The "hard data" items of turbidity, streamflow, total suspended solids and stream temperature are not being monitored in timber sale projects."

[Draft Five-Year Review and Evaluation Report (Fiscal Years 1988-1992), August 1993.]
Also according to the KNF:

> Forest Plan Direction as amended by INFS in July 1995 is very clear regarding transportation systems and roads. …five Standards and Guidelines …deal specifically with roads. …These five Roads Management Standards and Guidelines direct the Kootenai National Forest to improve existing roads so they do not retard the attainment of RMOs nor do they adversely affect native fish. …Furthermore there is very specific direction to identify those areas that are chronic problems and fix them. ***If we are not following the direction of INFS regarding these Standards and Guidelines then we are operating outside the Forest Plan.***

(Sept. 17, 1998 memo "Subject: State BMP Audits, KNF Problems", emphasis added.) A joint Montana/Forest Service Audit of BMP effectiveness reviewed sales on the Flathead, Lolo, and Kootenai National Forests in 1998, and reached the following conclusions:

> ***The consistent problem they found is that main haul routes that are used by multiple sales are not being brought up to meet BMP standards.*** In particular, roads that were designed in the past to route road surface drainage, including the ditch flow, directly to streams continue to plague us. This same philosophy also produces ditches that run for hundreds or even more than a thousand feet without relief. They found this problem on all three National Forests during these audits. At each instance, the Forest involved stated that the road was used by many sales and activities and that it was not correct or fair to expect the audited sale (unit) to have brought the road up to BMP standards. In almost all instances, and the Kootenai in particular, Forest officials stated that the amount of money required to bring these up to BMP standards was not the problem. Besides mentioning the multiple user concept, they often stated that they had chosen to not spend funds here but rather to

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> spend funds closer to the sale area. These roads were used by the audited sale and thus they had the opportunity and responsibility to do something about such problems. Use of these roads during a timber sale gives us an opportunity to make the needed changes and, in fact, might be the only way we can accomplish this. ***Many times these are the very roads with the opportunities for the worst impacts. They are frequently lower elevation and close to major fisheries streams. In other words, a BMP violation here may allow a direct impact on the water resource as compared to a road along a smaller intermittent tributary at the upper end of a basin.*** If we use such roads we should bring them up to BMP standards…

(Id., emphasis added.) According to a March 11, 1999 memo from the Regional Forester's Office entitled "Subject: Montana 1998 Best Management Practices Audits":

> Forest Service activities continue to have minor and major departures on many Projects… A majority of the departures are related to road drainage, both surface and cross drainage… The BMP Audits were performed on a sampling of our road system and suggest that ***our road system, in general, does not adequately protect water quality***. We must be aggressive and creative in utilizing all of our funding opportunities to correct the defective features in our entire existing road system region-wide. This is especially important in project planning where a preliminary assessment of the BMPs and project viability suggest the project may not be able to meet all BMP requirements on the existing road system needed for the project.

(Emphasis added.) According to KNF Hydrologist Steve Johnson:

> The Water Quality Bureau, through numerous letters to the Region and to this Forest, have given us a three-part interpretation of what we need to do to meet the Clean Water Act, and to fully meet our mandate as the water quality management agency for NFS lands… 3. Document the protection of beneficial uses. FP Monitoring Item F-2, sediment impacts on fishery habitat, was specifically identified as our way of showing that sediment, the #1 potential pollutant from our activities according to hundreds of studies, was not detrimentally impacting the beneficial use of fisheries

(3/19/98 memo obtained under FOIA.) According to Johnson, "I don't think we are meeting requirement three of this list… I think a series of stations across the forest, in both managed and un-managed watersheds, that annually recorded a parameter such as cobble imbeddedness or particle-size distribution would be a start on this effort." (Id.)

"(S)ustained moderate increases in water and sediment yields have resulted in the establishment of a 'press' disturbance regime… The existing press disturbance regime is characterized by nearly constant moderate levels of effects (increased water and sediment yields)." (Fortine DEIS, KNF, 2004 at 3-73.)

The DSEIS fails to disclose that small headwater channels are especially vulnerable to increased erosion and sediment transport to downstream habitats caused by increased peakflows (King, 1989). Increased peakflows lead to head cutting channel erosion, expansion of cross-sectional channel area, channel widening, and elevated bank erosion. Increases in peakflow, alone, can increase

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erosion in smaller streams contributing to downstream sedimentation in pools and low gradient stream reaches. King (1989) warned that the increased peakflow documented in watersheds in northern Idaho could increase downstream sedimentation since sediment transport was highly correlated to peak streamflow magnitude. The DSEIS fails to adequately disclose that these impacts can be extremely significant, even if they are presently immeasurable due to limitations in technology.

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Indeed, staying within the recommended PFIs has resulted in significant damage. This is reflected in the failure to meet all RMOs—the existing conditions. This reveals that recommended PFIs are not a reliable way to predict the damaging effects of water yield increases due to management activities. It should be noted that the DSEIS also fails to disclose the values of PFIs over time following past management actions, as modeled for past NEPA documents prepared to justify logging in these watersheds. Since the damage already exists, it is arbitrary and capricious to go forward with the Selected Alternative, clearcutting or otherwise reducing tree canopy cover over more acres, causing even more damage to the watershed and aquatic habitat.

Another major problem with the ECA and WATSED is that they fail to take into account the extreme peak flow increases due to the high density of roads in the project area. As was pointed out in the Ecology Center's January 25, 2000 letter to the KNF Forest Supervisor:

> Project analyses generally far underestimate the impacts of roads upon the affected watersheds. In a letter to the Kootenai National Forest, dated February 6, 1995, entitled: Factors Supporting Road Removal and/or Obliteration, Forest Hydrologist Steve Johnson, states, "Impacts from roads basically fall into three areas: introduced sediment into streams; snowmelt re-direction and concentration; and surface flow production."

In his memo to the Kootenai National Forest, Johnson (1995) discusses how "snowmelt re-direction and concentration and surface flow production" increase peak flow amounts multiplicatively by the presence of roads in a drainage. Typical KNF project analyses fail to acknowledge the degree to which roads increase peak flows above the amounts the Forest Plan Peak Flow Increase models estimate.

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Johnson adds, "For the roads we no longer actively use, our dwindling road maintenance budget will make it difficult to maintain the culvert crossings. When these fail during storm and runoff events, tremendous amounts of sediment can be delivered directly to the channel and from there down to lower streams with significant beneficial uses such as sensitive fish habitat." The DSEIS fails to disclose the significance of this foreseeable lack of maintenance, and the direct, indirect and cumulative effects poorly maintained roads have on water quality.

Johnson also pointed out in his memo that the old road design—the road design used on many roads in the project area—utilized ditches on the inside of the road which greatly increases drainage efficiency, causing peak flows to go far beyond any modeled predictions. So the very existence of the current road network is causing major water quality impacts.

Since modeled numbers and other statistics for peak flows are only estimates, the amount of

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Response to Comment #129: It is acknowledged that increased PFIs can cause negative effects within a watershed (FSEIS, Pages 115 to 116). King 1989 is cited in the FSEIS on Page III-115. However, if the smaller headwater channels within the Project Area were being degraded as a result of increased erosion and sediment transport and contributing effects to the low gradient stream reaches would be revealed by monitoring in the lower reaches. There are 10+ years of stream monitoring data displayed in the FSEIS (Pages III-114 to 120). The monitoring data for Young and Dodge Creeks show both as being stable and in good condition.

Response to Comment #130: Past PFIs can be found in the previous NEPA documents commenter cites earlier in the comment letter. Water Table 3-4 of the FSEIS displays the recommended PFIs for past documents (Page III-121). It is unclear what "damage to the watersheds" the commenter is referring to. The FSEIS displays the conditions of the watersheds (Pages III-114 to 120). Neither Dodge nor Young Creek is listed as a Water Quality Limited Segment (FSEIS, Page III-118). Both DEQ and EPA have reviewed the project and not expressed concerns about the conditions of the watersheds.

Response to Comment #131: The FSEIS discusses roads and the potential effects roads can have on watersheds on Pages III-112, 113, 122-125, 127-128, 133-134. If roads were currently degrading conditions it would be evident in the monitoring data. There are 10+ years of stream monitoring data displayed in the FSEIS (Pages III-114 to 120). The monitoring data for Young and Dodge Creeks show both as being stable and in good condition. Both DEQ and EPA have reviewed the project and not expressed concerns about the conditions of the streams in the Project Area.

error in such statistics should be disclosed in the EIS to shed light on the real meaningfulness of differences in the various predicted ECA and WATSED figures used in analyses of the various alternatives. Indeed, the undated KNF memo admitted that peak flow increases should be listed as a "range" of allowable increases. It is possible that differences may be mostly or entirely error. Whenever comparisons are made which rely on numerical value estimates, the amount of expected precision, or lack thereof, must be disclosed. This makes it possible for the decision maker and public to tell if the differences between alternatives in ECAs in specific watersheds are meaningful, or if the amount of inherent error or uncertainty in the models precludes such comparisons. #132

This is not to say that insignificant differences between alternatives in <u>modeled results</u> means that the alternatives have virtually the same impacts. It just means the model itself is not precise enough to detect differences in impacts between alternatives. The DSEIS completely fails to disclose the amount of reliability and validity in the data and models.

#133 The DSEIS fails to disclose the sediment yield due to simply increase use of the roads due to logging and administrative traffic. From an investigation of the Bitterroot Burned Area Recovery Project, hydrologist Rhodes (2002) notes, "On all haul roads evaluated, haul traffic has created a copious amounts of mobile, non-cohesive sediment on the road surfaces that will elevate erosion and consequent sedimentation, during rain and snowmelt events." USDA Forest Service, 2001a also presents an analysis of increased sedimentation because of log hauling.

Another problem with the ECA analysis is that, in the past, the KNF has blindly assumed that staying below the recommended maximum threshold will protect water quality, ***while the current instability and sensitivity of these creeks contradicts such an assumption.*** Scientifically performed validation and verification are important aspects of using predictive models, and the scientific method means using observations to arrive at conclusions.

Since some watersheds already fail to meet all Riparian Management Objectives (RMOs) and are contributing to the situation where some are listed on the WQLS list, the modeling procedure cannot be relied upon anyway. This is reinforced in the three KNF internal memos on water quality analysis.

Since modeled numbers and other statistics for peak flows are only estimates whose valid uses can only include comparison purposes, the amount of error in all statistics should be disclosed to shed light on the real meaningfulness of differences in the figures. It is possible that differences may be mostly or entirely error. Statistically, error should best be expressed by the use of confidence intervals.

#134 It should be noted that the DSEIS also fails to disclose the values of ECAs over time following past management actions, as modeled for past NEPA documents prepared to justify logging in these watersheds. Since the damage already exists, it is arbitrary and capricious to go forward with the Alternative 1, clearcutting or otherwise reducing tree canopy cover over more acres, causing even more damage to the watersheds and aquatic habitats.

In many ways the KNF's use of modeling parallels the FS' use of models on the Ozark-St.

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Response to Comment #132: The FSEIS discloses a summary of the analysis methods, assumptions, and limitations of ECA/WATSED modeling on Pages III-112-113. Additional information can be found in the Water Specialist Report and R1-WATSED/Water Yield Process Documentation in the Soil and Water Project File. Peak flow interpretations are based on trends and relative differences between alternatives, and do not require nor assume that values are precise (FSEIS, Page III-112-113). However, recent literature (Grant et al 2008) concludes that we are probably overestimating the amount of influence forest management has on peak flows, especially with regard to the larger flows the commenter is concerned with. This seems to correspond with the stream monitoring data for Young and Dodge Creeks (FSEIS, Pages III-114 to 120).

Response to Comment #133: The FSEIS relies upon 3 different analyses to address the concern with roads and increased sediment. Road densities are a commonly used indicator for potential sedimentation affects to watersheds. The FSEIS discusses road densities on Pages III-112, 113, 122-125, 127-128. Effects from road use are addressed more specifically through the BMP discussions in the FSEIS on Pages III-124-125, 127-128, 130, 133-134 and Appendix 2. Page III-136 of the FSEIS states that the "monitoring between 1991 and 2005 shows that 95% of the BMPs implemented during that time were effective." In addition, stream monitoring data (FSEIS, Pages III-114 to 120) does not show degraded conditions from past logging traffic that was at least as high as that proposed in this project and from road densities that were higher than current levels.

Response to Comment #134: Past PFIs can be found in the previous NEPA documents commenter cites earlier in the comment letter. Table 3-4 of the FSEIS displays the recommended PFIs for past documents (Page III-121). It is unclear what "damage to the watersheds" the commenter is referring to. The FSEIS displays the conditions of the watersheds (Pages III-114 to 120). Neither Dodge nor Young Creek is listed as a Water Quality Limited Segment (FSEIS, Page III-118). Both DEQ and EPA have reviewed the project and not expressed concerns about the conditions of the watersheds.

Francis National Forest. "With the model the national forest uses, the more degraded a landscape is, the easier it is to justify more disturbance." (FSEEE, 2003.) In a recent newspaper the FS admits they won't have enough funding to meet the maintenance needs of the roads on the KNF, and despite the apparent promises of the DSEIS all the road work won't necessarily be funded—timber sales or no timber sales. The DSEIS fails to disclose if all roads in the project area will be brought up to BMP standards. The DSEIS fails to disclose the risk of resulting chronic watershed impacts of these continuing sub-standard roads and road/stream crossings. Even if all roads were to be brought up to BMP standards, it is clear that more maintenance will be needed in later years, without the DSEIS identifying the needs nor the funding to achieve them. The issue of BMPs has been clouded by the FS. The Lolo NF and Northern Region Office point out how, during even large-scale projects, not all problem sites are restored up to BMP standards (Lolo BMP Memo), thus allowing chronic, persistent watershed damage to continue indefinitely. The KNF's recent Trego DN admits that effectiveness of BMP work is not complete, rather temporary, and in need of frequent monitoring and maintenance: BMPs are proven practices that ***reduce*** the effects of roads to the watershed. They are not remedies for walking away from the road forever. …Traffic and other factors …degrade these features. That is why BMPs are not static. BMP structures need to be maintained and monitored as conditions change. (Trego DN at Appendix 5-17, emphasis added.) Even if all roads were to be brought up to BMP standards, it is clear that more maintenance will be needed in later years, without the DSEIS identifying the needs nor the funding to achieve them. This was the subject of a comment on the KNF's Smoked Fish EA, where the EPA stated: (I)t is not clear if roads would be maintained on a continuing basis so that sediment reduction benefits from BMP upgrades would be long-term. We are concerned that the Kootenai National Forest (KNF) may lack adequate funding to maintain forest roads on a continuing basis… Unless road BMPs are maintained on a continuing basis, sediment reduction benefits may be temporary, and may not contribute to improved water quality restoration over the long term, especially if some roads encroach on streams. (Smoked Fish DN at B-56.) Furthermore, the DSEIS fails to disclose that INFISH buffers do not necessarily prevent further temperature increases in the streams. The programmatic bull trout Biological Assessment and Biological Opinion discusses how upland forest canopy removal causes higher water temperatures. Also, further aggradation of the stream channels due to increases water yield will lead to shallower, wider channels, which will naturally mean more of the water surface exposed to warm air in summer. The FS has failed to obtain or maintain any past or current hard population or inventory or monitoring data for the ESA listed and Sensitive fish species at issue in the project area or for the 75	#135 #136 #137	Response to Comment #135: The FSEIS discloses the miles of road BMPs on Pages II-32 and III-124 that will be addressed with this project. BMPs are proven practices that reduce the effects roads have on watersheds, but they are not permanent remedies BMPs need to be monitored and maintained as conditions change. A percentage of BMP work is done across the Forest each year with maintenance funds. Harvest funds actually increase the amount of BMP improvements that can be done. BMP effectiveness monitoring has been conducted and is referenced in the FSEIS on Pages III-114 to 120. Monitoring data has shown that the current levels of BMP improvements and maintenance are protecting the streams within the Project Area (FSEIS Pages III-114 to 120). Response to Comment #136: Temperature data and discussion are found on page III-142. Further temperature discussions and anticipated effects from different activities can be found in Volume 4 Documents 22 through 25 of the Project File. The FSEIS does not corroborate the assertion that there would be "further aggradation of the stream channels…". Page III-116 states, "Therefore, it appears that past and current levels of PFIs are not causing channel degradation in and around the monitoring sites in the Young and Dodge Creek Watersheds." Water Figures 3-1 and 3-2 on page III-117 show this graphically. Page III-1119 also discloses that no channel changes are anticipated from a change in PFI. Without any anticipated channel changes, there should be no change in surface water temperatures. The analysis did not rely on the statement from the programmatic bull trout Biological Assessment and Biological Opinion, but instead relied on stream temperature data that is disclosed on page III-142, combined with stream monitoring data collected over the years. Response to Comment #137: Fish population information is disclosed on pages III-142 through III-147. MAP 3-8 displays fish distribution within the Analysis Area. Population viability documentation for westslope cutthroat and eastern brook trout can be found in Volume 4 Documents 18 through 20 of the Project File. Most of the upper Kootenai metapopulation is found in Canada and is only incidental to the Analysis Area. Montana Department of Fish, Wildlife, and Parks also regulates a limited harvest for bull trout in Koocanusa Reservoir.

KNF as a whole. Distribution, status and population trends have not been determined. The FS hasn't even determined the minimum viable population as NFMA requires. Best Management Practices (BMPs) have failed to prevent degradation of water quality. BMPs that have already failed cannot be relied upon to prevent further water quality degradation. Beschta et al. (2004) state: It is perhaps widely accepted that "best management practices" (BMPs) can reduce damage to aquatic environments from roads. Time trends in aquatic habitat indicators indicate, however, that BMPs fail to protect salmonid habitats from cumulative degradation by roads and logging (Espinosa et al. 1997.) Ziemer and Lisle (1993) note a lack of reliable data showing that BMPs are cumulatively effective in protecting aquatic resources from damage. INFISH and BMPs fail to prevent degradation of water quality and aquatic habitats, more logging and road building with implementation of INFISH and BMPs cannot be relied upon to prevent further water quality degradation. Not all Riparian Management Objectives (RMOs) are being met and the DSEIS gives no indication of how, if ever, they would be met under the existing management regime. The KNF instead wants to reject RMOs without ever considering the adverse, long-term cumulative damage caused by logging that have led to the situation where native fish habitats are being kept to a degraded condition. Lacking current survey data that indicates healthy, viable populations of native fish, the KNF fails to insure viability as NFMA requires.	#138	**Response to Comment #138:** Physical habitat data and PACFISH/INFISH Biological Opinion Monitoring findings are disclosed on page II-140 -142. RMOs have never been proven to be a model of "good fish habitat". Fish population information is disclosed on pages III-142 through III-147. MAP 3-8 displays fish distribution within the Analysis Area. Population viability documentation for westslope cutthroat and eastern brook trout can be found in Volume 4 Documents 18 through 20 of the Project File.
The DSEIS is entirely inadequate in its disclosures of present stream conditions and habitat conditions for aquatic species. The failure to provide high quality information based on up-to-date stream condition and aquatic species' habitat condition surveys fails to comply with NEPA and NFMA.	#139	**Response to Comment #139:** The FSEIS presents habitat data from multiple survey years for both Young and Dodge Creeks on pages III-140 and III-142. The latest survey data was collected in 2006. No additional data was collected between the DEIS and DSEIS, however, data was collected during the summer of 2010. This data has not been analyzed at this time.
The FS did not consider, however, the incidence of mass failures that have impacted streams beyond INFISH buffers. Belt et al., 1992 state: Trapping sediment and associated nutrients is one of the most commonly cited reasons for establishing buffer strips. In forested areas within mountainous terrain, water containing sediment regularly moves through buffer strips as channelized flow and less frequently as overland or sheet flow. Channelized flow moves sediment much greater distances than sheet flow does. Research shows sediment in channels can move a thousand feet or more, whereas sheet flow moves sediment three hundred feet or less. (P. 3.) …(R)iparian buffers are not effective in controlling channelized flows originating outside the buffer… (Id.) According to Brown (1985), streamside buffer strips are "of little value in handling erosion from side slopes above the buffer in most of the mountainous West." Erosion in western forests, unlike that from agricultural watersheds where sheet erosion is common, is more likely to occur as channelized flow through the buffer strip. This is due to the relatively high degree of slope dissection by ephemeral 76	#140	**Response to Comment #140:** There have been no mass failures to consider in the Analysis Area. A discussion of sensitive soils is covered on pages III-14 and III-16. Mass failures are relatively rare on this District.

> channels in upland areas adjacent to the riparian zone These channels frequently continue through the buffer strip to the channel. Where these channels do not exist, however, sheet flows do move overland. (P. 15.)

Furthermore, the DSEIS fails to disclose that INFISH buffers do not necessarily prevent further temperature increases in the streams. The programmatic bull trout Biological Assessment and Biological Opinion discusses how upland forest canopy removal causes higher water temperatures. Also, further aggradation of the stream channels due to increases water yield will lead to shallower, wider channels, which will naturally mean more of the water surface exposed to warm air in summer.

The FS has failed to obtain or maintain population trend data for project area streams and rivers to assure compliance with NFMA. Current numbers are meaningless without knowledge of the populations' responses to management. Nor does the KNF maintain inventory data and monitoring results for the TES and Sensitive fish for the KNF as a whole. Distribution, status and population trends have not been determined. The FS hasn't even attempted to determine the minimum viable population as NFMA requires.

In response to our comments, the FS states that the KNF does not have any aquatic Management Indicator Species. This is contradicted by the Forest Plan definition of indicator species, which reads:

> Species identified in a planning process that are used to monitor the effects of planned management activities on viable populations of wildlife ***and fish*** including those that are socially or economically important. (Forest Plan at VI-9, emphasis added.)

Furthermore, the Forest Plan at Appendix 12 (Indicator Species) at p. A 12-1 states that its selected indicator species "Hunted, ***Fished*** and Trapped" (emphasis added) are the elk, whitetail deer, and mountain goat. How the KNF could monitor the effects of Forest Plan implementation on "viable populations of …fish" using elk, whitetail deer, and mountain goat is a quandary they themselves have not resolved.

The DSEIS discusses BMP monitoring, but fails to disclose that such monitoring is basically implementation monitoring, not monitoring of BMP effectiveness in protecting water quality and aquatic habitats.

Mass failures ("debris slides") can easily travel through INFISH buffer strips causing huge amounts of sediment increases into streams Since INFISH and BMPs fail to prevent degradation of water quality and aquatic habitats, more logging and road building with implementation of INFISH and BMPs cannot be relied upon to prevent further water quality degradation.

The FS has failed to monitor the long-term impacts on water quality and fish habitat from implementing the Forest Plan. As a result, the cumulative impacts of logging and road building are not sufficiently disclosed in the DSEIS or anywhere else. The following are Forest Plan monitoring items relevant to water quality and fisheries, for which the FS is lacking valid monitoring results:

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#141

Response to Comment #141: This paragraph is a repeat of an identical paragraph on page 75 of this comment letter. Please see Response to Comment #139.

#142

Response to Comment #142: Populations of westslope cutthroat and eastern brook trout are localized and mainly confined to Young and Dodge Creeks, respectively, the information displayed on pages III-143 through III-147 and the viability discussions can be found in Volume 4 Documents 18 through 20 of the Project File.

#143

Response to Comment #143: Management Indicator Species are designated at the Forest Plan Level, not at the site-specific project level. You are correct; none of the Forest Plan MIS include a fish species. However, the FSEIS did analyze the effect to fish, specifically, westslope cutthroat trout on page III-147 under the "Analysis of Direct and Indirect Effects" heading.

#144

Response to Comment #144: BMP effectiveness monitoring has been conducted and is referenced in the FSEIS on Pages III-114 to 120. Monitoring data has shown that the current levels of BMP improvements and maintenance are protecting the streams within the Project Area. DEQ and EPA have reviewed the project and not expressed concerns with regard to water quality in the Project Area.

#145

Response to Comment #145: The long-term impacts on water quality from implementing the Forest Plan are displayed on page III-118, particularly in Water Figure 3-3 and the paragraph that precedes it. The long-term impacts on fish habitat from implementing the Forest Plan are displayed on page III-119. By its very nature, the habitat survey methodology conducted in this Analysis Area is a cumulative effects survey that captures habitat data influenced by all environmental events and human activities that occur above and upstream of any point that is surveyed. The cumulative effects discussions regarding vegetation management activities are found on page III-128 for water quality and III-150 for fish habitat. The cumulative effects discussion regarding road management activities are found on pages III-130 for water quality and pages III-157 for fish habitat.

Item C-9: Insure that the intent of riparian management goals are met, measuring riparian habitat condition.
Item C-10: Monitoring is to assure changes in fish habitat and numbers do not exceed those predicted, measuring fish habitat and spawning habitat.
Item F-2: Sediment impacts on fish habitat, measuring bedload movement, suspended solids, and streamflow.

Furthermore, results of monitoring the impacts of a host of past projects in the Project Area were not adequately disclosed in the DSEIS.

IX. OTHER NEPA VIOLATIONS.

The KNF never released to the public all the Five Year Review (FYR) proceedings, and failed to follow through on its stated commitments to share with the public a subsequent FYR Report. The KNF also has failed to adequately respond to the important new information that proceeded from its secretive FYR process. #146

The KNF has failed to live up to its promises, made in the Forest Plan, to fully monitor, evaluate, and timely report to the public the effects of implementing the Forest Plan, as the National Forest Management Act (NFMA) and its implementing regulations require. #147

The KNF has made over 70 Forest Plan amendments [16] since adoption of the Forest Plan that specifically allowed logging levels to be higher than otherwise allowed by the Plan, however the KNF failed to complete a cumulative effects analysis of all those amendments.

The KNF has failed to properly consider in their proper NEPA and NFMA context much other new information (including scientific), some of which is discussed in above sections of this Statement of Reasons, indicating the assumptions implicit in the Forest Plan are invalid. #148
Hayward, (1994) states:

> Despite increased interest in historical ecology, scientific understanding of the historic abundance and distribution of montane conifer forests in the western United States is not sufficient to indicate how current patterns compare to the past. In particular, knowledge of patterns in distribution and abundance of older age classes of these forests in not available. …Current efforts to put management impacts into a historic context seem to focus almost exclusively on what amounts to a snapshot of vegetation history—a documentation of forest conditions near the time when European settlers first began to impact forest structure. …The value of the historic information lies in the perspective it can provide on the potential variation… I do not believe that historical ecology, emphasizing static conditions in recent times, say 100 years ago, will provide the complete picture needed to place present conditions in a proper historic context. Conditions immediately prior to industrial

[16] After a determination made by the Chief on an appeal of the Forest Plan, determinations previously called "exceptions" to the Forest Plan were correctly identified as needing to go through the Forest Plan Amendment process and therefore we include them under the term of "Amendments" even though many had already been approved as what was called "exception."

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Response to Comment # 146: Forest Plan Revision began in 2002, the Analysis of the Management Situation (AMS) was completed in 2003, and the Forest has been in plan revision since that time. The monitoring reports for the Kootenai Forest state that "The Kootenai and IPNF developed an Analysis of the Management Situation (AMS) in March of 2003. The AMS served as our five year monitoring summary and presented valuable monitoring and evaluation information which was used to assist us in identifying changes for Forest Plan Revision."

The 2007 annual monitoring report also served as a five year review. The report and cover letter are located here: http://www.fs.usda.gov/main/kootenai/landmanagement/planning

Response to Comment #147: The KNF has released a Forest Plan monitoring report annually since 1988 disclosing the effects of implementation of the Forest Plan.

Response to Comment #148: New information pertaining to the Young Dodge project was considered during the development of this supplemental EIS, including science referenced by the commenter. Please see the table at the end of Chapter IV (Page IV -103)

Comment	#	Response
development may have been extraordinary compared to the past 1,000 years or more. Using forest conditions in the 1800s as a baseline, then, could provide a false impression if the baseline is considered a goal to strove toward.		
This it really calls into question the entire mechanical manipulation/ prescribed burning regime. The managed portion of the project area has been fundamentally changed, so the FS must consider how much native forest you've fundamentally altered compared to historic conditions forestwide before pursuing "treatments" here. Essentially, this means considering new scientific information on all kinds of changes away from "historic conditions"— and in the forestwide context of Forest Plan Revision—not on a project-level basis prior to revision.	#149	Response to Comment #149: The Young-Dodge Project is a site specific project and has analyzed the relevant information in order for the decision-maker to make an informed decision.
As the Ninth Circuit has recently stated (in *Ecology Center v. Austin*) on this issue: Although treatment may be designed to restore ... "historic conditions," Ecology Center points out this can be a misleading concept: for example, **information regarding historic conditions is incomplete; altering particular sections of forest in order to achieve "historic" conditions may not make sense when the forest as a whole has already been fundamentally changed;** many variables can affect treatment outcomes; **and the treatment process is qualitatively different from the "natural" or "historic" processes it is intended to mimic.**		
X. MORE ISSUES		
The DSEIS fails to recognize that the fisher was recently found to be "warranted" for listing under the Endangered Species Act. The DSEIS discloses the minimum PPI for the entire KNF, but does not provide current population estimates on the Forest to validate the PPI and insure viability. Fisher populations can be estimated based upon population surveys, but the DSEIS fails to state why surveys are not done for this species, be "warranted" for listing under the Endangered Species Act. Nor does the DSEIS justify why surveys for other Sensitive and indicator species are not performed in a systematic way on the KNF. The DSEIS does not say that the project area is outside the historical range of fisher. Zielinski and Stauffer, 1996 provide information on surveying for fisher.	#150	Response to Comment #150: The recent finding for fisher was published after the DSEIS had gone to print. A request from FWS for any information on fisher was published in April 2010. The KNF responded to this request. The FSEIS disclosed the best information currently available on the KNF concerning fisher based on observations and mortality records in district files. The FSEIS never claims that the KNF is outside of the fisher's historic range.
The DSEIS relies upon Brewer, 2009 in its goshawk analysis. This utilization of the study needs to be re-examined since Brewer's assumptions include erroneously treating three of Reynolds' (1992) VSS classifications as equivalent in their contributions for goshawk habitat.	#151	Response to Comment #151: Brewer, 2009 was used in the FSEIS to demonstrate that goshawks have been found to use other habitats and other vegetative age classes other than mature and old growth forests. The Reynolds (1992) habitat management strategy for goshawks has been used on the Rexford Ranger District. Reynolds suggests that both the post-fledgling area and territory retain 60% of these areas in mature forest and that the remaining 40% be made up of a mosaic of forest age classes. Reynolds continues to suggest the size of treatment units for both the PFA and territory. The Reynolds strategy could have been applied had a goshawk nest been located within the Young Dodge Planning Unit.
The DSEIS fails to discuss why less than 30% of the minimum PPI for goshawks is currently occupied on the KNF, and the viability implications. The available evidence indicates that the low number of goshawks in the project area and forestwide **do not** constitute minimum numbers and distribution indicative of a viable population on the KNF. Yet, the Young Dodge DSEIS failed to disclose or incorporate this information.	#152	Response to Comment#152: Goshawks are known to build alternate nest and there are a variety of reasons why they may not be active or occupy known nest sites on the KNF. The Young Dodge analysis included the best information currently available on goshawks for the Forest and several field visits to treatment units and potential goshawk habitat to survey/ find goshawks. While goshawks have been seen no nests were located. However, areas suspected of having active nests were dropped from treatment units.
The Regional Office's determination that the goshawk no longer belongs on the Sensitive list for the KNF is arbitrary and capricious, and thus the Young Dodge DSEIS must fully address viability for the northern goshawk.	#153	Response to Comment #153: The Regional Office decision to remove the goshawk from the sensitive species list is beyond the scope of this project. The goshawk is analyzed beginning on Page III-194.
The DSEIS, as stated above, relies upon Samson documents as its "proxy" for goshawk viability. The scientific adequacy of Samson documents for this use has never been demonstrated. The FS	#154	Response to Comment #154: The Samson document is clearly defined under its methods and background section as a "conservation assessment" that "includes the peer-reviewed, non-peer reviewed publications, particularly unpublished master's thesis and PhD dissertations, research reports, and data accumulated by the Forest Service. Where possible, the peer-reviewed professional society literature is emphasized in that it is the accepted standard in science." Disclosure of this documents validation or non-validation is demonstrated by its incorporation into the bibliography for the Young Dodge FSEIS.
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repeatedly refuses to submit Samson's documents to an independent scientific peer review, and instead keeps the issue mired in the realm of scientific controversy. There is very much evidence to doubt Samson. For example, the Lewis and Clark National Forest in Montana annually monitors all active goshawk territories/nests on that Forest. (*See e.g.* Exhibit B: 2008 Monitoring Results from Goshawk Monitoring on Lewis and Clark National Forest.) Examining those monitoring results and comparing those to the numbers that the Samson documents indicate should appear on that Forest, it is clear that Samson's numbers simply cannot be relied upon. For the boreal (western) toads, listed as Sensitive, the DSEIS does not provide a minimum PPI nor provide population survey numbers, which should assist in assuring viability. The same for Townsend's big-eared bats and wolverines—the DSEIS is inadequate for assuring viability as required under NFMA.	#155	**Response to Comment #155:** The Young Dodge FSEIS utilized known science to ensure quality and essential habitats, especially breeding and rearing habitats for these species were protected during and after proposed treatments. If potential population numbers had been suggested by this science, then that information would have been disclosed. Any known specialized habitats such as wetlands for amphibians and caves or mines for bats are or would have been protected by the management requirements and design criteria for this project. If the Lands Council or any other organization has information on suggested population numbers for these species then the biologist on the KNF would like to review this information for future analyses.
The DSEIS does not even attempt to explore an alternative more in line with the management philosophy of the KNF's own Alternative D-Modified from its draft Forest Plan Amendments for Motorized Access Management within the Selkirk/Cabinet-Yaak Grizzly Bear Recovery Zones (hereinafter, "Access Amendment"). Apparently, the FS has already made its decision on that Access Amendment, despite public pronouncements otherwise. With the Young-Dodge DSEIS, the agency had a chance to inform the decision makers on the Access Amendment how the differences between its "preferred" alternative and D-Modified could play out on the ground, in a project area. Unfortunately, it seems the FS doesn't want to be informed beyond its "preferred" narrow thinking on the subject. So we have a draft project EIS prejudicing not only a future decision on this project, but also a wider forest plan amendment process.	#156	**Response to Comment #156:** The Young Dodge analysis is based on the management direction currently in place. The ID team received no direction to utilize the Young Dodge proposal as a "prototype" for implementing any alternative of the draft Access Amendment. The Young Dodge project does not foreclose options based on future management direction. The 2011 Access Amendment was released on November 9, 2011, before the release of the Record of Decision for the Young Dodge Project.
The DSEIS also fails to indicate that the amount of "take" (as defined in the ESA) represented by the current and project-influenced situation—both inside and outside the official grizzly bear Recovery Area—would be consistent with both the ESA and all Forest Plan standards and guidance for this species. Adopting Access Amendment D-Modified to manage for improved grizzly bear security would also provide benefits for a host of Threatened, Endangered, Sensitive, and Management Indicator species which occur in the Young-Dodge Project area. From the Access Amendment Draft SEIS: • Alternative D Modified would convert the most roads and consequently would provide the highest degree of habitat security and a lower mortality risk to the **Canada lynx**. (P. 70.) • Alternative D Modified would provide a higher degree of habitat security (for **gray wolves**) than Alternative E Updated… (P. 74.) • Alternative D Modified … could contribute to a cumulative increase in habitat security for **black-backed woodpeckers** (and **pileated woodpeckers**) because timber sales or other ground disturbing or vegetation management activities would be less likely to occur in Core Areas. Newly dead trees that support wood boring beetle populations would be less likely to be removed during vegetation management activities or by woodcutters. Alternative D Modified could provide slightly more secure habitat than Alternative E Updated. (P. 84, 112.) • Alternative D Modified … could contribute to a cumulative increase in habitat security because timber sales or other ground disturbing or vegetation management activities 80	#157	**Response to comment #157:** The Young Dodge analysis included the interim direction for managing human access on the Forest and was updated to reflect direction in the 2011 Access Amendment. Following implementation of the Young Dodge proposal, grizzly bear habitat and associated management parameters actually improve in the planning unit and within the Cabinet-Yaak Recovery Zone because additional roads are disinvested and percent core habitat is increased respectively. The determination for grizzly bear is "may affect, not likely to adversely affect" indicating that there would be no additional "take" as a result of the Young Dodge project. Concurrence on this finding for the grizzly bear from the USFWS is 3/9/2012.

Comment	#	Response
would be less likely to occur in Core Areas. Snags would be less likely to be removed during vegetation management activities or by woodcutters. Alternative D Modified could provide slightly more secure habitat(for **Townsend's big-eared bats, flammulated owls, fringed myotis bats**) than Alternative E Updated. (Pp. 85, 86, 95.) • Alternative D Modified and Alternative E Updated provide different levels of habitat security (for **peregrine falcon, fisher, wolverine**) based on the relative amount of wheeled motorized vehicle access. (Pp. 87, 89, 91.) • Alternative D Modified, which closes the most miles of road in suitable habitat, would be the preferred alternative for the western toad. (P. 101.) • Alternative D Modified closes the most miles of road in suitable habitat and would provide the greatest benefits for the **goshawk**. (P. 103.) • Alternative D Modified, which closes the most miles of road in suitable habitat, would be the best Alternative for **elk**. (P. 104.) • Alternative E Updated would provide some security and reduced vulnerability (for **moose**), but not as much as Alternative D Modified. (P. 104.) • Although Alternative D Modified and Alternative E Updated would benefit **mountain goats**, Alternative D Modified would improve security and reduce the risk of displacement more than Alternative E Updated. (P. 109.) • Alternative D Modified would improve security (for **pine marten**) more than Alternative E Updated. (P. 110.) Remarkably, this in a DSEIS from an "agency bias is so blatant that we question whether USFS hasn't intentionally skewed the Alternative D Modified analysis to paint the most bleak picture possible" (Great Bear Foundation et al. 2009). Great Bear Foundation et al. 2009 discuss in great detail how the Forest "Service's Preferred (Access Amendment) Alternative will lead to a significant deterioration in an already unacceptable Baseline Condition" for grizzly bears. The scientific discussions in Great Bear Foundation et al. 2009, as well as our comments on the Access Amendment DSEIS easily refute the FS's claim to be utilizing the best available science for the grizzly bear. Given the extensive past logging in the Project Area and across the KNF as a whole in recent decades, we are very concerned about the cumulative impacts on Threatened, Endangered, Sensitive, and Management Indicator wildlife species. We are aware that the Kootenai National Forest has been managed down to a level of functioning habitat for old-growth associated wildlife that is **below what even the agency considers assures viable populations**, and is well below the historic range of variability. The Idaho Panhandle National Forests developed a set of proposals to respond to the Columbia Basin scientific studies, for management of mature and old growth forests of the Coeur d'Alene River Basin (Zack et al., 1997). Along with that came proposals for Wildlife Priorities and Recommendations and a Wildlife/Carnivore Conservation Strategy (Idaho Panhandle National Forests, 1997a and 1997b), and altogether they took strides towards creating a landscape plan for conservation of wildlife species. Zack et al., 1997 "addresse(d) the following six issues and related UCRB DEIS objectives and standards": 1. Define mature and old forests: develop Coeur d'Alene sub-basin specific standards that address criteria in DEIS (Table 3-2 on page 29 of chapter 3; Standards HA-S5, HA-S6, HA-S7, & HA-S8); 81	#158	**Response to Comment #158:** Old Growth Table 3-2 on page III-158displays the estimated reference conditions for old growth based on VRUs in the Young Dodge planning unit. It also displays the existing condition for old growth (designated and undesignated) by VRU. How much old growth actually existed on the ground, exposed to natural events and native people's manipulation, prior to European settlement and subsequent logging, is purely speculative. The amount and types of old growth are tracked at the Forest level and require Forest Supervisor approval for changes. Any available field data from planning unit surveys (e.g. goshawk, flammulated owls, bird point-count surveys) will continue to be used to assist in the viability analysis for old growth associated species until new direction becomes available.

2. Address appropriate species composition for mature/old forests (Table 3-2 on page 29 of chapter 3; DEIS Objectives & Standards HA-02, HA-S6, TS-O6, TS-S11, TS-O8, TS-S15, TS-S16, TS-S17, TS-O10, & TS-S21; DEIS Appendix H);
3. Specify amount of mature and old forest needed to meet the desired range of future conditions, and how much old relative to mature (DEIS Table 3-2 on page 29 of chapter 3; Objectives and Standard PE-O4, PE-S3, HA-O2, HA-S6, TS-O9);
4. Address issues of mature and old forest landscape pattern -- including patch size, shape, inclusions, distribution, and appropriate connectivity between patches (DEIS Objectives & Standards HA-02, HA-S2, HA-S6 and TS-O8; DEIS Appendix H);
5. Relate amount, distribution, and connectivity of mature/old forests to objectives and standards for Riparian Conservation Areas (DEIS Objectives & Standards AQ-S6, AQ-S7, AQ-S9, AQ-S10, HA-02, HA-S2, HA-S6, TS-O2, and TS-O8; Appendices G & H);
6. Address appropriate amounts and distribution of snags, large down wood, and other structural legacies of mature/old forests (DEIS Objectives & Standards PE-O4, PE-S1, PE-S3, TSO2, TS-S2, TS-O6, TS-O8, TS-O10, HA-S7, HA-S8, & HA-S9; DEIS Appendix H)

Regarding #3 above ("amount of mature and old forest needed to meet the desired range of future conditions, and how much old relative to mature") Zack et al, 1997 state:

> Desired condition maintains 30% total mature and old forest on National Forest lands, assessed at the scale of the entire National Forests ownership in the Coeur d'Alene Geographic Area. Desired future condition is 15% mature forest and 15% old forest. However, since there is not currently that much old forest, a compensating amount of mature forest will be designated as replacement old forest.

#159

The 15%/15% strategy, if implemented on the KNF, would be responsive to the Forest Plan's recommendation: "In the long term, it will be necessary to designate younger stands to be managed as old growth in the future but, it is premature to make extensive designations of future old growth until a clear picture of the existing status and distribution can be determined." (Forest Plan at Appendix A 17-12.) We assume that 23 years of Forest Plan implementation must have given the FS this "clear picture", so if the FS does not agree that this 15%/15% strategy, from the national forest immediately adjacent to the west, is not appropriate for the KNF please disclose the strategy the FS does see as appropriate for the KNF.

Response to Comment #159: The FSEIS disclosed the status of old growth within the Project Area on pages III-155-165.

#160

In response to NFMA's viability provisions, the Forest Service Manual outlines the need to design and implement conservation strategies for Sensitive and other species for which viability is a concern. The Forest Service Manual at FSM 2621.2 states:

> To preclude trends toward endangerment that would result in the need for Federal listing, units must develop conservation strategies for those sensitive species whose continued existence may be negatively affected by the forest plan or a proposed project.

As far as we are aware, the KNF has not undertaken any conservation strategy similar to Zack et al. 1997, in order to assure forestwide viability of old-growth associated wildlife. Therefore we ask that the FS implement such an approach to address these issues in the Project Area and on the KNF.

Response to Comment #160: The FSEIS disclosed the status of wildlife indicator species within the Project Area on pages III-177-III-194.

Information from Gautreaux, 1999 indicates that about 22% old forest or old growth is at the lower limit for "reference conditions" on the KNF. The KNF's Ducker and Sullivan, 2001 state:

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"We recognize that historical conditions probably provided a higher level of old forest habitat through time than what is provided by the Forest Plan direction (a mean of 27.7% as opposed to 10%)." So utilization of the Forest Plan's 10% old-growth Standard itself is not consistent with the KNF's own best available science on "reference conditions." Lesica (1996) stated that use of 10% as minimum old-growth Standard may result in extirpation of some species. This is based on his estimate that 20-50% of low and many mid-elevation forests were in old growth condition prior to European settlement. If that is not "best science", please cite what the FS considers to be "best science" to the contrary position that species require **less than half** the habitat levels that they evolved with, and that even **that** habitat does not have to be in blocks large enough to support most old-growth species. #161

Best available science, as reflected in the Forest Plan, is clear that blocks of old-growth timber less than 50 acres in size do not "provide habitat for those wildlife species dependent on old-growth timber for their needs" (Forest Plan old-growth standard). The KNF's Sparring Bulls DEIS states that "There are a total of 9,028 acres designated for old growth management within the project area. These acres are situated in 62 blocks ranging from 7 to 2,097 acres in size. Of these designated old growth blocks, 63% are greater than 50 acres in size." (3-117.) Since the Forest Plan indicates that blocks of old-growth timber less than 50 acres[17] in size do not "provide habitat for those wildlife species dependent on old-growth timber for their needs", how can it be "best science" for any of the 37% of the blocks that are less than 50 acres to be considered "effective"?

Forestwide, how many miles of local roads open to public access for a portion of the year either bisect or are adjacent to old growth stands? #162

Much of the old growth on the KNF was designated prior to "the criteria to identify stands that may qualify as old growth habitat (Green and others, 1992, corrected 02/2006). How many acres of designated or undesignated effective old growth on the KNF have not been field surveyed using the Green et al criteria? Does the designation survey process rely only upon the "minimum characteristics" or are the associated characteristics also believed to be important considerations in the determination of whether a stand is effective, replacement, or not old growth? #163

The DEIS at 3-115 states, "Data sources to identify old growth stands include… the Forest Inventory and Analysis (FIA) data which collects and reports data at the Forest scale." How many FIA plots were done on the KNF, and how many of those total plots fell within old growth that is in the KNF's inventory of "designated effective old growth" or "undesignated effective old growth"? What is the size, in acres, of each FIA plot on the KNF? #164

Does the Forest Plan discuss edge effects in terms of the usefulness of the edge-affected habitat by the old-growth MIS or for any of the other approximately 58 species of wildlife on the KNF that rely or depend upon old-growth habitat for their long term survival? #165

The Forest Plan defines a minimum viable population as 40% of a wildlife species' population potential and available information reveals the KNF now only contains habitat sufficient to #166

[17] Forestwide, the FS includes 503 of such <50 acre blocks (out of 1460 total) in its inventory of designated effective old-growth habitat.

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Response to Comment #161: Old Growth Table 3-2 on page III-158 displays the estimated reference conditions for old growth based on VRUs in the Young Dodge planning unit. It also displays the existing condition for old growth (designated and undesignated) by VRU. How much old growth actually existed on the ground, exposed to natural events and native people's manipulation, prior to European settlement and subsequent logging, is purely speculative. The amount and types of old growth are tracked at the Forest level and require Forest Supervisor approval for changes. Any available field data from planning unit surveys (e.g. goshawk, flammulated owls, bird point-count surveys) will continue to be used to assist in the viability analysis for old growth associated species until new direction becomes available.

Response to Comment #162: The Young Dodge FSEIS disclosed the amount of road (73,920 feet or 14 miles) that is adjacent to or through designated (MA 13) effective and replacement old growth in Old Growth Table 3-3 on page III-159.

Response to Comment #163: Information request for old growth conditions and or survey methods on the Forest should be directed to the Supervisor's office in Libby, Montana. Old growth blocks that may have been in question within the Young Dodge analysis area were field reviewed by either ID teams and/or the wildlife biologist considering multiple elements of old growth, not just the minimum characteristics. Replacement old growth typically contains the large tree component of old growth and possibly adequate amounts of down wood, but likely does not contain the vertical vegetative structure consistent with most old growth types and is not considered effective for most associated species at this time.

Response to Comment #164: Information request for old growth conditions and or FIA survey results on the Forest should be directed to the Supervisor's office in Libby, Montana.

Response to Comment #165: Yes and no. The Forest Plan (p. A17-9) discusses edge effects and old growth in terms of block size, connectivity, and distribution across the landscape. It discloses that blocks of 1000 acres would meet the needs of most associated species, however, that this size block may not be compatible with most forest management activities. A lengthy discussion of old growth and its management is available in Appendix 17 of the current Forest Plan.

Response to Comment #166: The KNF utilizes information on suitable habitat as well as any survey and monitoring information available to assist in the analysis for resident species. The Forest also utilizes any population information or species trend information from other agencies as well as potential population indexes from best science as part of its analyses.

support 30% of the population potential for its designated old-growth management indicator species, the pileated woodpecker. (**Johnson, 1999 and Johnson, 2003.**) The FS has chosen to utilize habitat as a proxy for species populations in the KNF. According to the best information currently available, the old-forest (>150 years old) habitat potential for the KNF is 42% and currently there is only 12% of this older habitat, which confirms the 30% habitat potential for the KNF old-growth indicator species (that is, 12/42 = 28.6%), and demonstrates the forest is far below the 40% habitat potential (.40 X 42% = 16.8%) that is defined in the Forest Plan as the minimum species viability threshold. The Kootenai National Forest's own analysis (Gautreaux, 1999) reveals 10% to be, quite realistically, not within the historical range, and indicates that 22% old growth is at the lower limit for "reference conditions" on the KNF. The DSEIS cannot even provide an estimate of how much old growth in the project area has been destroyed by logging.

The FS acknowledges that 34% of the old-growth blocks counted as "effective" old-growth in the KNF are less than 50 acres, however Forest Plan states that this designation of such small blocks as effective was to be the "exception rather than the rule."

The FS's own assessment is that the old-growth MIS pileated woodpecker no longer has enough habitat to support a minimum viable population, according to the best available science relied upon when formulating the Forest Plan itself. Thomas (1979) provides that "Management below the 40-percent level may be too low to maintain self-sustaining populations of a species." According to the best information currently available from the Forest Service, "Historically the KNF was probably able to support between 335 and 1384 breeding pairs of pileated woodpecker." As noted above, the Forest Plan establishes the minimum viable population of the pileated at 40% of its potential population in the KNF, in accordance with standard scientific methodology for insuring viability. Thus, the minimum viable population for the pileated woodpecker in the KNF is **554 breeding pairs** (40% of 1384). However, according to FS representations in the case *WildWest Institute v. Castaneda*, the KNF currently contains habitat sufficient to support **425 breeding pairs** of pileated woodpecker, or 30% of the potential population.

By definition, then, as a matter of both science and fact, the Forest Service no longer contains sufficient habitat to maintain a viable population of its old-growth management indicator species on the Kootenai National Forest. In the total absence of a scientifically sound viability strategy and population monitoring information, logging ***any*** forest that provides habitat for old-growth wildlife species is unwise and simply illegal. The DSEIS states the project "May impact …" several species that rely on areas of old growth for their existence. #167

This specious analysis itself undermines the proxy on proxy methodology, since the rationale for preserving 40% of the potential habitat of the MIS pileated woodpecker was not just to insure that the pileated *itself* would not be extirpated, but rather to insure the future viability of *all* old-growth associated wildlife species. Many of these species are far more sensitive to habitat depletion than the pileated woodpecker—which has since been recognized as more of a generalist that can adapt to different habitat types, and not a specialist that depends solely on old-growth habitat for its survival. At least as early as March of 1997, the KNF recognized that the presence of pileated woodpeckers alone is not an accurate indication of occupation by old- #168

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Response to Comment #167: The amount and types of old growth are tracked at the Forest level. Any available field data from planning unit surveys (e.g. goshawk, flammulated owls, bird point-count surveys) will continue to be used to assist in the viability analysis for old growth associated species until new direction becomes available. The FSEIS discloses that the Young Dodge proposal "may impact individuals and/or their habitats and gave rationales for why these impacts would not contribute to a trend toward federal listing and these findings vary by species.

Response to Comment #168: While the pileated woodpecker may not fully address the habitat needs for all old growth associated species, it certainly addresses many of the resource elements typically found in old growth and mature forests. The pileated will continue to serve as the MIS for old growth species as long as the 1987 KNF Forest Plan remains in effect.

growth associated wildlife species, since the "landbird monitoring results for the Northern Region showed pileated woodpeckers present to varying degrees in *all vegetation types* sampled except agricultural and residential," and that pileateds "are relatively common in both uncut and cut mid-elevation conifer forests… The species appears to do well in a matrix of forest types…"

#169 The FS has not firmly established the objective physical criteria that KNF forest stands must meet for designation as "replacement" old growth[18], or any indication of the time frame necessary before these stands can meet the needs of species of concern. In other words, there is no cogent strategy for conserving this habitat and ensuring species viability.

Response to Comment #169: The amount and types of old growth are tracked at the Forest level and require Forest Supervisor approval for changes. Old growth conditions are re-examined upon initiation of new projects as part of the analysis of the existing condition.

#170 The FS also relies upon a database (TSMRS) of timber stand examination information documented by stand examiners who are not necessarily wildlife biologists. This has led to inaccurate designations of old growth, as well as invalid assumptions by biologists doing habitat analyses for timber sales. The FS does not reconcile its use of timber stand database for wildlife habitat analyses and the fact that they have discredited such use:

> Habitat modeling based on the timber stand database has its limitations; the data are, on average, 15 years old; canopy closure estimates are inaccurate; and data do not exist for the abundance or distribution of snags or down woody material…. (USDA Forest Service, 2000c.)

Statistically speaking, how old is the data relied upon by the KNF for its old-growth associated wildlife habitat models/estimates of the current amounts of habitat?

Response to Comment #170: The KNF revisited its old growth status and completed that review as directed by court in 2004 using the best information available at that time. The findings of that review are available at the KNF Supervisor's Office in Libby, Montana. A summary of the existing old growth conditions for the KNF and Young Dodge Planning Unit is given on page III-156 of the FSEIS. Old growth conditions are revisited as part of examining the existing condition upon initiation of new projects, especially those at the planning unit level, so the data for determining old growth is not static. Often, due to wildfires or insect infestations, previously existing old growth stands no longer meet all the criteria which qualified them as old growth. Stands in these conditions are replaced with higher quality stands, when available, and upon Forest Supervisor approval.

While the Forest Plan recognizes that, based on the best science available to it at that time for its old growth MIS, "units of 50-100 acres are the smallest acceptable size in view of the nesting needs of pileated woodpeckers… (McClelland, 1979)," and that "managing for a minimum size of 50 acres will preclude the existence of species which have larger territory requirements," and thus undermine the methodology by which the pileated woodpecker habitat serves as an indicator for all old-growth species, the Forest Service still refuses to address the problems created by doing exactly what the Forest Plan cautioned against.

We support the proposition that in a given landscape, where old growth is in short supply due to past logging, it will sometimes be necessary to protect remnant old-growth habitat blocks that are too small to meet the needs of old-growth species, and utilize them as "stepping stones" to recovery for the affected species. However, that is not the same as relying on such isolated blocks to meet the forest-wide 10% standard. If these blocks do not meet the needs of old-growth dependent species, then they should not be counted as "effective" old-growth habitat.
The fact that the Forest Service did not intend to allow replacement old-growth to be counted toward the forest-wide 10 percent effective old-growth habitat standard becomes quite evident from an examination of the Forest Plan's old growth strategy, set forth in Appendix 17, which refers to:

[18] Scientifically objective criteria include those that could be utilized by independent trained surveyors using the same methodology to reach the same conclusions about a given stand's old-growth character. That would address the reliability/consistency issue as explained by Huck (2000).

- the need for minimum amounts of "legitimate" old-growth - referring back to more detailed definitions of old-growth habitat characteristics;
- the need to insure that "legitimate old-growth does not drop below minimum levels"; and,
- the strategy to also designate "young stands" in MA 13, "called replacement old-growth", for silvicultural treatments designed to "encourage development of old-growth characteristics" in order that these stands could eventually ""replace" currently designated old-growth".

#171

In sum, there remain a lot of serious questions and substantial doubt as to the issue of existing old-growth habitat in the KNF, as well as anticipated levels in the near future. Accordingly, it is imperative that old-growth wildlife species population monitoring be implemented now and into the next planning cycle. The best way to assure the public that old-growth wildlife species' viability is being insured, and has not been irreparably damaged by implementation of the current Forest Plan, is to simply tell the public what viable populations for species of concern are (as NFMA requires), and how that compares to existing populations. The proxy-on-proxy approach has failed to adequately address these concerns, after 23 years of habitat inventory. These issues must be addressed and all questions answered honestly and fully. Only then, with sufficiently complete information, can the public have a truly meaningful opportunity to participate the management decisions regarding the KNF.

Since the FS is not meeting species viability requirements as discussed above, it is critical for the FS to take steps to develop a multiple species conservation strategy for the KNF, before degrading or damaging yet more habitat.

The Forest Plan Standard for cavity habitat states, "Specific Forest Guidelines exist and will be applied for ... Cavity habitat and dependent species (Appendix 16)." Kootenai Forest Plan direction for cavity habitat management is to maintain at least 40 percent of the potential population capacity of cavity-using species throughout National Forest lands, and at least 60 percent of the potential population capacity in riparian areas. (Sparring Bulls DEIS at 169.). The DSEIS fails to disclose that it is a **distribution** standard also. Forest Plan Appendix 16 states:

> Minimum levels for cavity habitat retention should be applied on a drainage or compartment area basis at the following recommended levels: at least 40% of the potential capacity will be maintained throughout commercial forest lands and at least 60% of the potential will be maintained in riparian areas.

#172

The DSEIS fails to disclose the consistency of project area Compartments with this Forest Plan established minimum.

#173

The Sparring Bulls DEIS states at 3-69:

> The Forest Plan recommends applying minimum cavity excavator potential population levels (PPL) on a drainage or compartment basis at the following levels: maintain at least 40% of the PPL throughout commercial forest lands, and maintain at least 60% of the PPL in riparian areas (Kootenai FP 1987). These recommended percentages equate to snag levels of approximately 0.9 snags per acre for the 40% PPL, and 1.35 snags per acre for the 60% PPL.

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Response to Comment #171: Old growth conditions are revisited as part of examining the existing condition upon initiation of new projects, especially those at the planning unit level, so the data for determining old growth is not static. Often, due to wildfires or insect infestations, previously existing old growth stands no longer meet all the criteria which qualified them as old growth. Stands in these conditions are replaced with higher quality stands, when available, and upon Forest Supervisor approval. Current FP old growth direction will remain in place until the new Forest Plan is approved and implemented.

Response to Comment #172: Old growth was broken down by Compartment and is available in the official Project File at Volume 5, Document 00015. Per advice from the Forest Biologist at the time (4/13/2007) of the analysis displaying old growth by the planning unit was chosen since according to the Forest Biologist, "The planning sub-unit boundaries do follow "major" drainage which is allowed in the FP per the word "or" compartment are timber compartments and most do not cover complete drainage at least not "major drainage" this issue was resolved several years ago as forest direction... districts could ALSO include compartment number if they choose to." This wording is available in the KNF Forest Plan, Volume 2, Appendix A, page 17-9. The planning subunit was chosen as the analysis boundary to remain consistent with other analyses on the KNF.

Response to Comment #173: The Sparring Bulls project is outside the scope of the Young Dodge Project.

#174 What are the scientific studies (cites) upon which those **percentages** are based? Also, what **size** (diameter, height) of snag and tree species is required to be counted? Finally, how do those sizes, amounts, and tree species take into consideration the various but specific needs of the many snag-dependent Sensitive ESA-listed, and Management Indicator Species on the KNF, and what are the scientific studies (references, cites) that are your basis?

#175 In the following paragraph from the Sparring Bulls DEIS (Id.), since the Forest Plan numbers differ from "optimal" levels, why not fully adopt at least those recommendations? Bull et al. 1997 severely criticize the use of Thomas 1979 as does the KNF Forest Plan, so why does the KNF still consider Thomas 1979 as "best available science?"

> The Kootenai NF has established optional snag management levels based on local data (Johnson 2005). These snag levels are greater than the KNF Forest Plan snag standards. The recommended snag level varies between 4 and 12 snags/acre depending on the VRU. These recommendations were considered in this analysis.

#176 To what degree do the "PPI" models used in the DSEIS for various Sensitive and MIS rely on the timber stand database? How have the habitat analysis models utilized in the DSEIS been validated, scientifically and statistically speaking?

#177 The DSEIS defines current PPI numbers for the present situation. Please disclose the baseline PPIs for those species (baseline as defined for this purpose as pre-management, relating to the range of natural historic conditions). Also, please define "minimum PPI" and disclose how those were determined for each wildlife species.

#178 For lynx, the DSEIS does not include an analysis or comparison of effects between each alternative.

The Forest Service's emphasis should shift from logging to carbon storage. All old-growth forest areas and previously unlogged forest areas should be preserved indefinitely for their carbon storage value. Forests that have been logged should be restored and allowed to convert to eventual old-growth condition. This type of management has the potential to double the current level of carbon storage in some regions. (Harmon et al., 2002; Harmon, 2001; Harmon et al., 1990; Homann et al., 2005; Solomon et al., 2007; Turner et al., 1995; Turner et al., 1997; Woodbury et al., 2007.)

Kutsch et al. 2010 provide an integrated view of the current and emerging methods and concepts applied in soil carbon research. It contains a standardized protocol for measuring soil CO_2 efflux, designed to improve future assessments of regional and global patterns of soil carbon dynamics. They state:

> Excluding carbonate rocks, soils represent the largest terrestrial stock of carbon, holding approximately 1,500 Pg (1015 g) C in the top metre. This is approximately twice the amount held in the atmosphere and thrice the amount held in terrestrial vegetation. Soils, and soil organic carbon in particular, currently receive much attention in terms of the role they can play in mitigating the effects of elevated atmospheric carbon dioxide (CO_2) and associated global warming. Protecting soil carbon stocks and the process of soil carbon

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Response to Comment #174: Old growth management guidelines and habitat characteristics originate predominately from the 1987 Forest Plan, Appendix 17. The science from which these guidelines are based can be found in Appendix 17 as well as the value of old growth to associated species (FP Appendix 17, p. 17-7). Since 1987, the science and analysis for old growth has evolved to include Green et al 1992; rev. 2005) and many others. This information is available in the analysis for old growth within the FSEIS beginning on page III-155.

Response to Comment #175: The Sparring Bulls Project is outside the scope of the Young Dodge Project.

Response to Comment #176: The KNF wildlife models utilize data from the Forest Service timber stand database, FACTS, VMAP, and FIA data depending upon what information is available for any given stand. The timber stand database and FACTS make up the majority of the information for most stands. While the models themselves are unpublished, the scientific documents used to establish the habitat parameters for the models have been peer reviewed. Additionally, the results of these models are used in conjunction with conditions found on the ground during various analyses. If and when inaccuracies are found during field reviews for a given stand, this information is documented in meeting notes for the proposed project which is part of the official project file.

Response to Comment #177: The data source, methods, and assumptions for each resource are described at the beginning of each resource analysis under "Data Sources, Methods, Assumptions, Bounds of Analysis." The information for how "minimum PPI" and the existing conditions for each resource are also disclosed in each resource section for which science was available to do so.

Response to Comment #178: The analysis for lynx and its habitat begins on page III-272 of the FSEIS. This analysis includes a comparison of effects among all alternatives as well as disclosure of how the project meets the standards of the Northern Rockies Lynx Management Direction including Vegetation Standard #6.

> sequestration, or flux of carbon into the soil, have become integral parts of managing the global carbon balance. This has been mainly because many of the factors affecting the flow of carbon into and out of the soil are affected directly by **land-management practices**.

(Emphasis added.) Keith et al., 2009 state:

> Both net primary production and net ecosystem production in many old forest stands have been found to be positive; they were lower than the carbon fluxes in young and mature stands, but not significantly different from them. Northern Hemisphere forests up to 800 years old have been found to still function as a carbon sink. Carbon stocks can continue to accumulate in multi-aged and mixed species stands because stem respiration rates decrease with increasing tree size, and continual turnover of leaves, roots, and woody material contribute to stable components of soil organic matter. There is a growing body of evidence that forest ecosystems do not necessarily reach an equilibrium between assimilation and respiration, but can continue to accumulate carbon in living biomass, coarse woody debris, and soils, and therefore may act as net carbon sinks for long periods. Hence, process-based models of forest growth and carbon cycling based on an assumption that stands are even-aged and carbon exchange reaches an equilibrium may underestimate productivity and carbon accumulation in some forest types. Conserving forests with large stocks of biomass from deforestation and degradation avoids significant carbon emissions to the atmosphere. Our insights into forest types and forest conditions that result in high biomass carbon density can be used to help identify priority areas for conservation and restoration. The global synthesis of site data (Fig. 3 and Table 2) indicated that the high carbon densities of evergreen temperate forests in the northwestern United States, southern South America, New Zealand, and southeastern Australia should be recognized in forest biome classifications.

Harmon, 2009 reviews, in terms as simple as possible, how the forest system stores carbon, the issues that need to be addressed when assessing any proposed action, and some common misconceptions that need to be avoided. He also reviews and assesses some of the more common proposals as well as his general scientific concerns about the forest system as a place to store carbon.

Finally, Hanson, 2010 states:

> Our forests are functioning as carbon sinks (net sequestration) where logging has been reduced or halted, and wildland fire helps maintain high productivity and carbon storage
>
> Even large, intense fires consume less than 3% of the biomass in live trees, and carbon emissions from forest fires is only tiny fraction of the amount resulting from fossil fuel consumption (even these emissions are balanced by carbon uptake from forest growth and regeneration).
>
> "Thinning" operations for lumber or biofuels do not increase carbon storage but, rather, reduce it, and thinning designed to curb fires further threatens imperiled wildlife species that depend upon post-fire habitat.

Project consistency/compliance with the Forest Plan/INFISH is partially determined by projects not retarding attainment of Riparian Management Objectives (RMOs). How has the KNF monitored projects since INFISH to make sure that they have not retarded RMO attainment?	#179	**Response to Comment #179:** Physical habitat data and RMO compliance are displayed in Fisheries Tables 3-1 and 3-2 on page III-140-141. The methodologies are described on page III-139. Further information on RMO attainment is found on pages III-141.
The DSEIS does not include an assessment of the appropriateness of the inventoried roadless area (IRA) boundaries. Map 3-13 shows areas outside Robinson Mountain IRA that are contiguous with the IRA and also unroaded. Any project impacts that threaten any area's later inclusion within an IRA, proposed Wilderness, or legislated Wilderness Area must be fully discussed within that context. Thank you for your attention to these concerns. It is our intention that the cited literature and documents be reviewed by your planning team and be part of the official record for the Young Dodge project. I will be happy to provide you with copies upon request. Please keep each organization on the list to receive all further public communications as this process moves forward. Sincerely, /s/ Jeff Juel The Lands Council 25 W Main Ave Ste 222 Spokane, Washington 99201 509-209-2401 Michael Garrity Alliance for the Wild Rockies P.O. Box 505 Helena, Montana 59624 406-459-5936 Documents cited Ducker and Sullivan, 2001. Old-growth Validation in the Lower Big Creek Planning Area. Memo dated December 11, 2001. Exhibit B: 2008 Monitoring Results from Goshawk Monitoring on Lewis and Clark National Forest. Great Bear Foundation, Defenders of Wildlife, Idaho Conservation League, Wildlands CPR, Natural Resources Defense Council, 2009. Comments on the Draft SEIS, Forest Plan Amendments for Motorized Access Management Within the Selkirk and Cabinet-Yaak Grizzly Bear Recovery Zones. June 22, 2009 Hanson, Chad 2010. The Myth of "Catastrophic" Wildfire: A New Ecological Paradigm of Forest Health. John Muir Project Technical Report 1 • Winter 2010 • www.johnmuirproject.org Harmon, Mark E. 2001. Carbon Sequestration in Forests: Addressing the Scale Question, 99:4 Journal of Forestry 24, 24-25, 29 (2001) (citing C.F. Cooper, Carbon Storage in Managed Forests, 13:1 Canadian Journal of Forest Research 155-66 (1983); Harmon et al., infra n. 34, at 699-702; R.C. Dewar, Analytical model of carbon storage in trees, soils and wood products of 89	#180	**Response to Comment #180:** The Kootenai Forest in May 1995, under the direction provided by the Regional Office in May 1983 established the boundaries for Robinson Mountain Roadless Area #164. It utilized the following criteria: 1) contiguous roadless lands over 5000 acres in size or contiguous to existing wilderness; and 2) generally exclude tentacles or fingers less than 1 mile wide. The forest utilized these established criteria with the following process for determining the Robinson Mountain area; 1) review quad maps to determine what areas were harvested or roaded since 1984; 2) review 1994 aerial photos to validate the quad maps which showed roads built and timber harvesting done since the 1992 photos; and 3) have the Rexford and Three River District(s) review the proposed roadless area map to remove any areas that may be under contract at that point of time. The map dated November 22, 1999 displayed areas which were recommended for inclusion to the main roadless area and those small areas which were recommended for exclusion. Boundary lines were adjusted to follow existing roadways or better definable boundaries on the landscape. A review of this map depicts that the process utilized in 1995 included all possible lands to the proposed Robinson Mountain Roadless Area #164. Since the establishment of the roadless, area no vegetative management has encroached upon the boundary. The prescribed burn within the boundary of the IRA (Unit 46) is to be aerially ignited and would not affect the roadless character of the IRA. Personnel utilized to accomplish the burn are required to either fly or hike into the unit. This unit is designed to benefit whitebark pine. Please see the Inventoried Roadless Area Analysis on Page 297.

managed forests, 8:3 Tree Physiology 239-58 (1991); and E.D. Schulze et al., Managing Forests after Kyoto, 289 Science 2058-59 (2000)).

Harmon, Mark E. 2009. Testimony Before the Subcommittee on National Parks, Forests, and Public Lands of the Committee of Natural Resources for an oversight hearing on "The Role of Federal Lands in Combating Climate Change", March 3, 2009. Mark E. Harmon, PhD. Richardson Endowed Chair and Professor in Forest Science, Department of Forest Ecosystems and Society, Oregon State University.

Harmon, Mark E. & Barbara Marks. 2002. Effects of silvicultural practices on carbon stores in Douglas-fir - western hemlock forests in the Pacific Northwest, U.S.A.: results from a simulation model, 32 Canadian Journal of Forest Research 863, 871 Table 3 (2002).

Harmon, Mark E, William K. Ferrell, and Jerry F. Franklin. 1990. Effects of carbon storage of conversion of old-growth forest to young forests. Science 247: 4943: 699-702

Homann, Peter S., Mark Harmon, Suzanne Remillard, and Erica A.H. Smithwick. 2005. What the soil reveals: potential total ecosystem C stores of the Pacific Northwest region, USA. Forest Ecology and Management 220: 270-283. (attached as Exhibit I)

Idaho Panhandle National Forests, 1997a. Wildlife Priorities & Recommendations, Coeur D'Alene GA - Step 6. Coeur d'Alene River Ranger District, Idaho Panhandle National Forests.

Idaho Panhandle National Forests, 1997b. Wildlife/Carnivore Conservation Strategy, Coeur D'Alene GA - Step 6. Coeur d'Alene River Ranger District, Idaho Panhandle National Forests.

Keith, Heather; Brendan G. Mackey and David B. Lindenmayer. 2009. Re-evaluation of forest biomass carbon stocks and lessons from the world's most carbon-dense forests PNAS July 14, 2009 vol. 106 no. 28 11635-11640

Kutsch, Werner L. Michael Bahn and Andreas Heinemeyer, Editors, 2010. Soil Carbon Dynamics: An Integrated Methodology. Cambridge University Press 978-0-521-86561-6

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Zack, Art; Bob Ralphs, Jim Byler, Jenny Taylor, Gayle Worden, Joyce Stock and Darrell Frogness. 1997. Mature/Old Forest Strategies (draft). Coeur d'Alene River Ranger District, Idaho Panhandle National Forests.

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Letter 4 Department of Interior

United States Department of the Interior OFFICE OF THE SECRETARY Office of Environmental Policy and Compliance Denver Federal Center, Building 56, Room 1003 Post Office Box 25007 (D-108) Denver, Colorado 80225-0007 July 26, 2010 9043.1 ER 10/528 Mr. Paul Bradford, Forest Superviosr Kootenai National Forest 1101 U.S. Highway 2 West Libby, MT 59923 Dear Mr. Bradford: The Department of the Interior has reviewed the Draft Supplemental Environmental Impact Statement for the Young-Dodge Project, Kootenai National Forest, Montana, and has no comments. Sincerely, Robert F. Stewart Regional Environmental Officer cc: Glen M. McNitt, District Ranger Ron Komac, ID Team Leader		Thank you for reviewing the DSEIS.

References Identified in Public Comments to the Young Dodge DSEIS Reviewed by the Interdisciplinary Team

Letter #	Author/Date/Title	Where Located in Project File	Comments
3	Adams and Froehlich. 1981. Compaction of Forest Soils.	Soil and Water	Relevant. The DSEIS states that the growth of trees and plants may be affected by compaction (Pages III-7 and 13). This is measured and displayed in the Detrimental Soil Disturbance Table (Page III-16) of the DSEIS. Detrimental soil disturbance is not permanently impaired, however, and root growth, moisture, and freezing/thawing work to reduce the compaction over time. The North American Long Term Soil Productivity Study (Page-Dumroese et al 2006, Fleming et al 2006, and Sanchez et al, 2006) has found little difference in site growth for the soil types in the Project Area.
3	Brais and Camire. 1997. Soil compaction induced by careful logging in the claybelt region of northwestern Quebec (Canada).	Soil and Water	Relevant and Not Relevant. Soil compaction is relevant to any discussion of soil effects and was analyzed on discussed on Pages III-6 to 10, and 13 to 18 of the DSEIS. This particular reference is less relevant to this project because it studies the claybelt soils of Quebec which are much different than the soils in the Young Dodge Project Area.
3	Brooks et al. 1991. Hydrology and The Management of Watersheds.	Soil and Water	Relevant. The second edition of this text book (1997) was cited in the DSEIS on Page III-101, 107, and 109.

Letter #	Author/Date/Title	Where Located in Project File	Comments
3	Christner and Harr. 1982. Peak Streamflows from the Transient Snow Zone, Western Cascades, Oregon.	Soil and Water	Relevant and Not-Relevant. Rain-on-snow events do occur on the Kootenai. However, they are rare in the Project Area (DSEIS, Page III-104). The assumptions and limitations of stream flow modeling are disclosed on Pages III-101 to 102 of the DSEIS. It may not be relevant because the paper states that one of the reasons for doing the research was because the Cascades are different than the Rockies or Sierra Nevada's where much of the previous research was conducted
3	Cullen et al. 1991. Timber Harvest Trafficking and Soil Compaction in Western Montana.	Soil and Water	Relevant. The DSEIS states that the growth of trees and plants may be affected by compaction (Pages III-7 and 13). This is measured and displayed in the Detrimental Soil Disturbance Table (Page III-16) of the DSEIS. Detrimental soil disturbance is not permanently impaired, however, and root growth, moisture, and freezing/thawing work to reduce the compaction over time. The North American Long Term Soil Productivity Study (Page-Dumroese et al 2006, Fleming et al 2006, and Sanchez et al, 2006) has found little difference in site growth for the soil types in the Project Area.
3	Grier et al. 1989. Productivity of Forests of the United States and Its Relation to Soil and Site Factors and Management Practices: A Literature Review.	Soil and Water	Relevant. Effects to soil productivity associated with timber harvest and burning was analyzed for this project and is discussed on Pages III-15 and 21 in the DSEIS.

Letter #	Author/Date/Title	Where Located in Project File	Comments
3	Harr. 1986. Myths and Misconceptions about Forest Hydrologic Systems and Cumulative Effects.	Soil and Water	Relevant. The assumptions and limitations of water modeling are discussed in the DSEIS on Pages III-100 to 102. That is why the DSEIS relies on stream monitoring (III-104 to 108) in conjunction with stream modeling for the effects analysis (Pages III-109 to 112).
3	Hoffman. 1993. Hydro-Climatic Analysis of Peak Flows in Northwest Montana and Northeast Idaho	Soil and Water	Relevant. This paper was cited in the DSEIS on Pages III-104 and 105.
3	Howes, Hazard, and Geist. 1983. Guidelines for Sampling Some Physical Conditions of Surface Soils.	Soil and Water	Relevant. The SQS does identify this paper as an example of a procedure to measure soil disturbance. However, the Region has adopted the protocols used for the North American Long Term Soil Productivity Study. The protocols and Regional Technical Guide can be found in the Soil and Water Project File.
3	King. 1989. Streamflow Responses to Road Building and Harvesting: A Comparison With the Equivalent Clearcut Area Procedure.	Soil and Water	Relevant. Elevated stream flows and peak flow increases are discussed in the DSEIS (Pages III-100 to 102, 109 to 114, and 121). This paper was cited in the DSEIS on Page III-104.
3	Kuennen et al. 1979. Soil Compaction Due To Timber Harvest Activities.	Soil and Water	Relevant. Soil compaction was analyzed for this project and is discussed in the DSEIS on Pages III-6 to 8 and 16 to 18. While this paper was not specifically cited, the lead author was cited repeatedly throughout the Soils Section of the DSEIS (Pages III-6, 7, 10, 11, 12, 16, 19, 23, and 26).
3	MacDonald and Hoffman. 1995. Causes of Peak Flows in Northwestern Montana and Northeastern Idaho.	Soil and Water	Relevant. Rain-on-snow events are not common in this area of the Kootenai National Forest as identified in the DSEIS (Page III-104), the Kootenai National Forest Hydraulic Guide (1990), and Hoffman 1993.

Letter #	Author/Date/Title	Where Located in Project File	Comments
3	Megahan. 1983. Hydrologic Effects of Clearcutting and Wildfire on Steep Granitic Slopes in Idaho.	Soil and Water	Relevant and Not-Relevant. The effects of PFI and roads are discussed in the DSEIS (Pages III-100 to 125). This paper specifically looks at granitic soils on steep slopes. Neither, of which, are typical in the Project Area.
3	Page-Dumroese. 1993. Susceptibility of Volcanic Ash-Influenced Soil in Northern Idaho to Mechanical Compaction.	Soil and Water	Relevant. Soil compaction is discussed in the DSEIS on Pages III-6 to 8, 14 to18, and 21 to 25. New information with regard to this research is available from this and other authors with regard to North American Long Term Soil Productivity Study (Page-Dumroese et al 2006, Fleming et al 2006, and Sanchez et al, 2006).
3	Page-Dumroese et al. 2000. Soil quality standards and guidelines for forest sustainability in northwestern North America.	Soil and Water	Not Relevant. Beyond the scope of this project. This paper addresses the suitability of existing R1, R4 and R6 soil quality standards, and as such is more appropriately directed to the forest or regional planning level. The DSEIS (III-25 and 26) documents project compliance with all Forest, Regional, and National requirements to protect characteristics of the soil resource.
3	Powers. 1990. Are We Maintaining the Productivity of the Forest Lands? Establishing Guidelines Through a Network of Long-Term Studies.	Soil and Water	Relevant. This paper was cited in the DSEIS on Page III-104.
3	Rhodes. 2002. BNF BAR Post-Fire Salvage Logging Field Review: 8/20-22/2002	Soil and Water	Not-Relevant. This was a review of a post-fire project on a different Forest. The Young Dodge project does not include fire salvage. In addition, the DSEIS discloses the effectiveness of BMPs on the Kootenai. Stream conditions in the Project Area support the conclusion that the level of road use, harvest activity, and BMP work are protecting beneficial uses.

Letter #	Author/Date/Title	Where Located in Project File	Comments
3	Thomas and Megahan. 1998. Peak Flow Responses to Clearcutting and Roads in Small and Large Basins, Western Cascades, Oregon: A Second Opinion.	Soil and Water	Relevant. Elevated stream flows and peak flow increases are discussed in the DSEIS (Pages III-100 to 102, 109 to 114, and 121). This paper is further evidence that modeling may be overestimating the PFIs from harvest for those flows with the potential to degrade channels. The paper states "treatment effects decreased as flow event size increased and were not detectable for flows with 2-year return intervals and greater." The 2-year return interval is bank full. So the increases in PFI were only detectable for flows less than those flows know to form/change channels.
3	Williamson and Nielsen. 1993. The influence of forest site and rate and extent of soil compaction and profile disturbance of skid trails during ground-based harvesting.	Soil and Water	Relevant. Soil compaction is discussed in the DSEIS on Pages III-6 to 8, 14 to18, and 21 to 25. The number of passes is irrelevant because all of the units with past harvest in this Project were field surveyed. These included digging and analyzing soil effects at depths greater than those cited by the commenter.
3	Beschta et al. 2004. Postfire management on forested public lands of the western United States.	Fisheries	This paper is referring to new road construction in this section that is quoted. There is no new road construction in this project. The Beschta paper is also a response to fire salvage, and is not applicable to this type of project.

Letter #	Author/Date/Title	Where Located in Project File	Comments
3	Espinosa et al. 1997. Case history: The failure of existing plans to protect salmon habitat on the Clearwater National Forest in Idaho.	Fisheries	This paper is about chinook salmon spawning streams in the Idaho Batholith, which is a much different geology than the Project Area. This is not a direct quote from the paper. The paper is mostly Espinosa's frustration with the use of the FORPLAN sediment model and the management of the Clearwater National Forest. He does allude to the Forest's reliance on BMPs to protect salmon habitat, but states that there is no validation of their effectiveness. BMP work done following the Young J fire salvage proved to be effective in the Project Area, as the baseline sediment levels in Young Creek declined to 2 mg/l from 4mg/l prior to the fire.
3	Ziemer and Lisle. 1993. Evaluating sediment production by activities related to forest uses: a Pacific Northwest perspective.	Fisheries	This paper concludes that manager's should not rely on models for BMP effectiveness monitoring due to the long time frames involved in accurately verifying any models of this nature and the knowledge gaps that exist with regard to sediment transport. No BMP effectiveness models were utilized in this project.
3	Belt et al. 1992. Design of forest riparian buffer strips for the protection of water quality: Analysis of scientific literature.	Fisheries	This paper is a synthesis of literature on riparian buffer strips in Idaho. The largest buffer provided in the Idaho Forest Practices Act is 75 feet and the smallest buffer is 5 feet, as stated on page 2 of the citation. INFISH buffers are a minimum of 300 feet for fish-bearing streams, 150 feet for non-fish-bearing streams, and 50 feet for seasonal drainages.

Letter #	Author/Date/Title	Where Located in Project File	Comments
3	Brown, G.W.1985. Forestry and Water Quality. College of Forestry, Oregon State University. Second Edition. p32.	Fisheries	If this is the correct literature, it is referring to erosion from harvest or roads. There is much newer research on this topic than this dated textbook. This reference does not mention "the incidence of mass failures" as the comment suggests. There are no known "mass failures" in the Young Dodge Project Area to consider.
3	USDA Forest Service, 2007. Marten Creek Environmental Impact Statement. http://www.fs.fed.us/r1/kootenai/projects/projects/marten/index.shtml	Fuels	Did not use in analysis. Agree with referenced statements from the document.
3	Kauffman, 2004. Death rides the forest. Perceptions of fire, land use, and ecological restoration of western forests.	Fuels	Did not use in analysis. Agree with referenced statements that fire is an integral part of restoring landscapes. Kauffman (2004) also states "in simulating wildfires in mixed conifer forests under severe weather conditions, Stephens (2008) reported that prescribed burning either alone or in conjunction with mechanical treatments was effective in decreasing extreme fire behavior." Kauffman (2004) also later states "the only known substitute for natural fires and their infinite number of effects on ecosystems is prescribed fire." Although restoring historical vegetation species and stand structure is a component of this project, it is important to understand that changing the intensity of a wildfire while maintaining ecosystem function is also essential to keeping landowners, firefighters, and the general public safe during a wildfire event. This project integrates prescribed fire with all vegetation treatments and incorporates maintenance burning and ecosystem burning without vegetation manipulation.

Letter #	Author/Date/Title	Where Located in Project File	Comments
3	Hutto, 1995. Composition of bird communities following stand-replacement fires in northern rocky mountain (U.S.A.) conifer forests.	Fuels	Not applicable to Young Dodge project. This study refers to fire salvage.
3	Hessburg, et al. 2007. Re-examining fire severity relations in pre-management era mixed conifer forests: interferences from landscape patterns of forest structure.	Fuels	Did not use in analysis. Agree with conclusion that fire regimes are not stable state. DSEIS does not make this assumption.
3	Baker, et al. 2006. Fire, fuels and restoration of ponderosa pine- Douglas-fir forests in the Rocky Mountains, USA	Fuels	Agree with some of the scientific findings. In Chapter III-28 of the DSEIS we acknowledge that stand replacement events in the dry forest did occur. Disagree with the conclusion that "Large, dead wood in most of these forests does not need reduction; certainly, raking, piling and burning large, dead wood is misdirected as these fuels may be ancient and are more likely to be in deficit than in surplus." Many of these fuels are not ancient, especially the needle/duff accumulations.
3	Schoennagel, et al. 2004. The interaction of fire, fuels and climate across Rocky Mountain forests.	Fuels	Did not use in analysis. Agree with statements found in document referencing restoration of low severity fire regimes in low elevation pine forests. This technique is applied on portions of the project area where it is applicable.
3	Baker and Ehle, 2001. Uncertainty in surface-fire history: the case of ponderosa pine in the western United States.	Fuels	Agree with some of the scientific findings. In Chapter III-28 of the DSEIS we acknowledge that stand replacement events in the dry forest did occur. Disagree with the conclusion that more study is needed before restoration strategies can be implemented.
3	Wuerthner, 2006. The Wildfire Reader: A Century of Failed Forest Policy.	Fuels	Did not use in analysis. Document is the forward of a book and is personal opinion of the author not scientific literature.
3	Finney and Cohen, 2003. Expectation and evaluation of fuel management objectives.	Fuels	Used Cohen 1999 and Scott 2003 in analysis, instead of Finney & Cohen 2003.

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3	Graham, et al. 2004. Science basis for changing forest structure to modify wildfire behavior and severity.	Fuels	Used in analysis. Page III-74 of the DSEIS.
3	Finney, 2001. Design of regular landscape fuel treatment patterns for modifying fire growth and behavior.	Fuels	Did not use in analysis. Agree with findings of literature that applying fuel treatments across a landscape is essential modifying fire behavior. Topological considerations were applied to the Young Dodge Project Area as were considerations for the location of local hazards, private land, travel corridors, international boundaries, and fuels accumulations.
3	Arno, et al 1995. Age-Class structure of Old growth Ponderosa Pine/Douglas-Fir Stands and Its relationship to fire history	Vegetation	Not relevant. Arno. Most of the sites studied in Arno, et al, 1995 are much drier than those in the project area. Arno, 1997, which was cited in the DSEIS, is a much more representative study.
3	Baker, et al 2006. Fire, fuels and restoration of ponderosa pine–Douglas fir forests in the Rocky Mountains, USA	Vegetation	Relevant. The preferred alternative utilize a variety of treatments that reflect this publications "variable severity model"
3	Hessburg, et al 2007. Re-examining fire severity relations in pre-management era mixed conifer forests: inferences from landscape patterns of forest structure	Vegetation	Irrelevant. The findings on page 20 of this document do not totally support the findings and conclusion, so an alternative hypothesis is offered to explain the anomaly in findings.
3	Keeling, et al 2006. Effects of fire exclusion on forest structure and composition in unlogged ponderosa pine/Douglas-fir forests.	Vegetation	Relevant. This publication presents so useful findings on the effects of fire exclusion, but the recommendations presented are opinion and not totally based on a scientific synthesis of the findings.
3	McClelland (update). Influences of Harvesting and Residue management on Cavity Nesting birds.	Vegetation	Relevant. The Preferred Alternative maintains a high component of large western larch as recommended by McClelland.
3	Hutto, Richard L. 1995 Composition of bird communities following Stand-Replacement fires in Northern Rocky Mountain (USA) Conifer forests	Vegetation	Irrelevant. It is outside the scope of the DSEIS to set policy about forgoing the suppression of stand-replacing fires. .

Letter #	Author/Date/Title	Where Located in Project File	Comments
3	Harvey, et al 1994. Biotic and abiotic Processes of Eastside Forest Ecosystems: The Effects of Management on Soil and properties, Processes and Productivity Processes and properties	Vegetation	Relevant. The DSEIS is in agreement with Harvey, et al. On page III-27 the DSEIS states "Forest insects and disease have also played a role in shaping vegetative patterns and diversity"
3	Dudley and Vallauri, 2004. Deadwood-living forests	Vegetation	Relevant. Page III-20 of the DSEIS recommends up to 30 tons/acre of deadwood to be left on-site to provide for nutrient cycling and to provide habitat for vertebrate sand invertebrates that utilize deadwood as habitat.
3	Noss, Reed F. 2001 Sustainability –A Citizens Guide.	Vegetation	Irrelevant. Noss's statement is opinion and not a scientific finding based on the synthesis of data.
3	Beier and Drennan. 1997.	Wildlife	Used by Lands Council to discuss canopy closures needed by goshawks (nesting, hunting). *General recommendations of this study are applicable, however, this study was conducted in Arizona. Brewer 2009 was used because it is review of several studies on goshawks from various types of habitats.*
3	Brewer 2009.	Wildlife	Lands Council challenges use of this citation as science to be used in analyzing goshawk habitat. *Used in DSEIS to describe the variety of habitats used by goshawks instead of a using a single study from in one habitat type.*
3	Bull et al. 1997.	Wildlife	Citation used by the Lands Council to question the KNF snag policies and use of Thomas etal 1979. *Applicable, other literature from the same researcher was utilized that is consistent with this study.*

Letter #	Author/Date/Title	Where Located in Project File	Comments
3	Bull and Blumton. 1999.	Wildlife	Citation used by The Lands Council as basis for pine marten conservation strategies. *Research not used. Pine marten was not specifically addressed in DSEIS, nor is it a sensitive or MIS, however effects to snags and down woody debris were analyzed.*
3	Cherry 1997.	Wildlife	Citation used by Lands Council to discuss the impacts that fire suppression and insect controls have had on primary habitat of the black-backed woodpecker. *Applicable and used in the Young Dodge analysis. This study is local to Montana.*
3	Clark and Majone 1985. (validity of models)	Wildlife	This citation was used by The Lands Council (DSEIS comment letter) in their challenge of the validity of the KNF developed wildlife habitat models. *While the models themselves are unpublished, the scientific documents used to establish the habitat parameters for the models have been peer reviewed.*
3	Clough 2000.	Wildlife	Used by Lands Council to emphasize the need for a conservative approach to forest management near goshawk nests where long-term monitoring has been absent. *Applicable, however other and more recent science (Brewer 2009) was used.*

Letter #	Author/Date/Title	Where Located in Project File	Comments
3	Crocker-Bedford. 1990.	Wildlife	Used by Lands Council to point out management strategies that are available to the KNF for the northern goshawk as well as post-timber harvest monitoring effects on goshawk. *Most of Crocker-Bedford research was conducted in the Southwest, however some basic conservation principles are applicable to Young Dodge. Citation not used for the Young Dodge analysis.*
3	Dolan, P., 1998a, b. Email discussion with USFS Region One wildlife biologists regarding black-backed woodpecker and attached "Salvage of Burned Stands: Wildlife Considerations." On file at Lolo National Forest.	n/a	Cited in WildWest scoping letter as well as Lands Council to discuss the importance of recently fire-killed timber to the black-backed woodpecker. *Not applicable to most elements of Young Dodge being that it is not a fire salvage. There are some roadside salvage areas, however, the timber in these areas have been dead for years and are not considered primary habitat for this species.*
3	Endangered Species Act. 1983. Rev.	Wildlife	Cited in The Lands Council DSEIS comment letter in their challenge that each agency is required to "use the best scientific and commercial data available," as related to grizzly bear management and human access. *A revised biological assessment for the grizzly bear and other listed species will be prepared for the Young Dodge DSEIS, addressing these concerns and ensuring compliance with ESA. Concurrence on this assessment from the FWS is pending.*

Letter #	Author/Date/Title	Where Located in Project File	Comments
3	Gautreaux. 1999.	Wildlife	Used by Lands Council to challenge the KNF Forest Plan old growth standard of 10% - best available science. *Applicable and used in the Young Dodge old-growth analysis. This study was conducted on the Kootenai National Forest.*
3	Graham et al. 1999.	Wildlife	Used by Lands Council to point out management strategies that are available to the KNF for the northern goshawk. *Basic principles applicable however study was based in Utah. Brewer 2009 was used instead because it was a review of multiple goshawk studies from various habitats.*
3	Green et al. 1992. Rev. 2006.	Wildlife	Mentioned by Lands Council as a set of criteria to determine/identify stands of functioning old-growth. *Applicable and used in the Young Dodge old-growth analysis. This study is widely accepted as best science and based in the Northern Region of the NFS.*
3	Greenwald et al. 2005.	Wildlife	A literature review used by Lands Council to discuss the habitat elements and needs of the northern goshawk. *This literature review was refuted by Reynolds etal 2005 stating the author misinterpreted the literature, and was not used in the Young Dodge goshawk analysis.*
3	Harris 1984	Wildlife	Used by Lands Council to emphasize the need for large areas of old-growth, acceptable/functional minimal sizes of old-growth stands, and the habitat effectiveness of fragmented old-growth. *Applicable and used in the Young Dodge old-growth analysis as science demonstrating edge effects on old growth.*

Letter #	Author/Date/Title	Where Located in Project File	Comments
3	Harris 1999.	Wildlife	Used by Lands Council to challenge use of the Northern Region snag protocol by the DSEIS and its validity. *Applicable, however, other science was used that was based in the Northern Region and locally from the Fortine Ranger District using locally collected data.*
3	Harrison and Voller 1998.	Wildlife	Used by Lands Council to emphasize the effects of forest edge and fragmentation on wildlife species especially those associated with interior habitats (linkages, gene exchange, population dynamics, viability). *Basic principles are applicable; other science used for Young Dodge analysis to maintain consistency with other projects on the KNF.*
3	Hayward and Escano 1989.	Wildlife	Used by Lands Council to discuss canopy closures needed by goshawks (nesting, hunting). *Basic principles are applicable; other science used for Young Dodge analysis to maintain consistency with other projects on the KNF.*
3	Hayward and Verner 1994.	Wildlife	Citation used by Lands Council as an example of adequate conservation strategies for owls endemic to the KNF. *Applicable and used in the Young Dodge analysis.*
3	Hillis et al. 2003.	Wildlife	Used by Lands Council to discuss the relationship between recently dead and dying trees (fire and insect killed) and the black-backed woodpecker. *Possibly applicable to small portion of roadside salvage in Young Dodge, otherwise, the project is not a fire salvage.*

Letter #	Author/Date/Title	Where Located in Project File	Comments
3	Huck 2000. (validity of models)	Wildlife	This citation was used by the Lands Council in their challenge of the validity of the KNF developed wildlife habitat models. *While the models themselves are unpublished, the scientific documents used to establish the habitat parameters for the models have been peer reviewed.*
3	Iverson et al. 1996.	Wildlife	Used by Lands Council to point out management strategies that are available to the KNF for the northern goshawk. *Applicable, however, other science used for Young Dodge analysis to maintain consistency with other projects on the KNF.*
3	Johnsen. S. 1996	Wildlife	Citation used by The Lands Council as basis for fisher conservation strategies. *Applicable and used in past analyses. Other science was used for Young Dodge analysis to maintain consistency with other projects on the KNF.*
3	Johnson 1999.	Wildlife	Used by Lands Council in discussing the current population potential/viability of the KNF MIS species pileated woodpecker as the MIS for old-growth. *Applicable and used in the Young Dodge analysis. Johnson discusses the numbers of pileated woodpecker the KNF could support based on the amount of available habitat, not the known numbers of this woodpecker.*

Letter #	Author/Date/Title	Where Located in Project File	Comments
3	Johnson 2003.	Wildlife	Used by Lands Council in discussing the current population potential/viability of the KNF MIS species pileated woodpecker as the MIS for old-growth. *Applicable and used in the Young Dodge analysis. Johnson discusses the numbers of pileated woodpecker the KNF could support based on the amount of available habitat, not the known numbers of this woodpecker.*
3	Jones. (undated)	Wildlife	Citation used by The Lands Council as basis for fisher conservation strategies. *Lands Council failed to disclose from this citation that fisher were found to extensively use edge environments (Kelly 1987) in New Hampshire and Idaho. Other literature from this same author, including Heinmeyer and Jones 1994 was used to maintain consistency in the analysis with other Districts on the KNF.*
3	Jones 1991 in Flathead NF Spotted Beetle EA.	Wildlife	Used by Lands Council to discuss post-timber harvest treatment areas by fisher. *Not available or reviewed; other literature from this same author, including Heinmeyer and Jones 1994 was used to maintain consistency in the analysis with other Districts on the KNF.*
3	Juday 1978.	Wildlife	Used by Lands Council to emphasize the need for the protection of old-growth relative to the sustainability of our national forests. *Consistent with other science (Askins 2000, Chen etal 1995, Russell and Jones 2000) demonstrating the importance of old growth used for this analysis. Other research was used to maintain the consistency between analyses on the KNF.*

Letter #	**Author/Date/Title**	**Where Located in Project File**	**Comments**
3	La Sorte et al. 2004.	Wildlife	Used by Lands Council to discuss the effect of forest opening and edges on goshawks as related to predation by other raptors and conversion of habitat. *Although this research was conducted in Arizona, basic principles are applicable to Young Dodge. Other research was used to maintain the consistency between analyses on the KNF.*
3	Lesica. 1996.	Wildlife	Used by Lands Council to challenge the KNF Forest Plan old growth standard of 10% - best available science. *Other science used (Gautreaux 1999) supports the likelihood that more than 10% of the landscape contained old growth forest. Ten percent is currently the minimum amount required by the Kootenai Forest Plan.*
3	Lehmkuhl et al. 1991.	Wildlife	Used by Lands Council to emphasize the effects of forest edge and fragmentation on wildlife species especially those associated with interior habitats. *Consistent with other science (Askins 2000, Chen etal 1995, Russell and Jones 2000) demonstrating the edge effects on interior habitats and old growth used for this analysis. Other research was used to maintain the consistency between analyses on the KNF.*
3	Lofroth 1997.	Wildlife	Used by Lands Council to discuss the diversity of habitats used by the wolverine. *Applicable and consistent with other research used for Young Dodge. Other research was used to maintain the consistency between analyses on the KNF.*

Letter #	Author/Date/Title	Where Located in Project File	Comments
3	Mander 1991.	Wildlife	Used by Lands Council to challenge use of habitat models in lieu of on ground surveys and assessments. *These models are used in conjunction with surveys and assessments. We do, however, have better information on some species than others.*
3	Maxell et al. 1998.	Wildlife	Used by Lands Council to discuss the habitats, status, and life-cycle of the boreal toad. *Applicable and consistent with other science used by the same author.*
3	Maxell 2000.	Wildlife	Used by Lands Council to challenge the analysis for boreal toads with emphasis on habitat fragmentation and effects of logging. *Applicable and used in the Young Dodge analysis.*
3	McClelland 1977.	Wildlife	Used by the Lands Council to point out the nesting requirements of the pileated woodpecker. *Applicable and used in the Young Dodge analysis.*
3	McClelland 1979.	Wildlife	Used by Lands Council to emphasize the relationship between old-growth larch stands and cavity nesting birds including the pileated woodpecker. *Applicable and used in the Young Dodge analysis.*
3	McClelland and McClelland. 1999.	Wildlife	Citation used by the Lands Council to challenge using the pilieated as an MIS for old growth associated species; nesting needs etc. *Applicable and used in the Young Dodge analysis as science to describe the habitat needs, biology, etc. of the pileated. The pileated will continue to serve as an MIS for old growth as long as the 1987 Forest Plan is utilized.*

Letter #	Author/Date/Title	Where Located in Project File	Comments
3	Mealey 1983.	Wildlife	Citation used by The Lands Council (DSEIS) to describe how pileated woodpecker habitat should be distributed for its viability. *Applicable, however, other science (McClelland documents, Bull and Holthausen 1993) was used to maintain consistency with other analyses on the KNF.*
3	Mills 1994.	Wildlife	Used by Lands Council to challenge the use of available habitat as a "proxy" for species numbers as relative to species viability and population dynamics (size, gene exchange, growth rates, linkages). *This issue has already been challenged in court with mixed findings. The KNF is only a land management agency. It does not directly manage wildlife species populations, therefore measurements of available habitat will continue to be used in conjunction with known territory sizes for resident species and any available population data as a viability analysis, until further directed. Otherwise this issue is beyond the scope of this project.*
3	Montana Fish, Wildlife & Parks. 2005.	Wildlife	Used by Lands Council to discuss the habitats of the boreal toad. *Applicable and consistent with other science (Maxell 2000) used for this species.*
3	Naficy 2005.	Wildlife	Used by Lands Council to challenge the KNF Forest Plan old growth standard of 10% and 50 acre minimum size- best available science. *The KNF has shown in court that it is meeting FP standards for old-growth. Old-growth areas less than 50 acres do not contribute to MA 13.*

Letter #	Author/Date/Title	Where Located in Project File	Comments
3	Noss 1993.	Wildlife	Used by Lands Council to emphasize the need for large "biological reserves accompanied by buffer zones and habitat connectors as way to "preserve wildlife diversity and viability." *Statement appears to contradict the Lands Council's claim that the amount of available habitat cannot be used as a "proxy" for species abundance and viability. As a land management agency, it seems logical that maintaining habitat for species will in turn assist in their viability over time. The Young Dodge analysis demonstrates the protection of area old growth and the maintenance of high levels of forest cover to assist in species dispersal. Although applicable, other science (Samson 2005) was used on this issue to maintain consistency between analyses on the KNF.*
3	Quigley et al. 1996.	Wildlife	Citation used by The Lands Council to emphasize the extent of old growth reduction which, has in turn, resulted in the decline of associated species. *Other science used (Gautreaux 1999) supports the likelihood that more than 10% of the landscape contained old growth forest.*
3	Reynolds et al. 1992.	Wildlife	Used by Lands Council to point out management strategies that are available to the KNF for the northern goshawk. *Applicable and many of the basic principles have been utilized on the KNF (i.e. McSutten EIS).*

Letter #	Author/Date/Title	Where Located in Project File	Comments
3	Ruggerio et al. 1994.	Wildlife	Citation used by The Lands Council as basis for fisher conservation strategies. Also used by Lands Council to challenge the use of available habitat as a "proxy" for species numbers as relative to species viability and population dynamics (size, gene exchange, growth rates, linkages). *Applicable and used in the Young Dodge analysis. This issue has already been challenged in court with mixed findings. The KNF is only a land management agency. It does not directly manage wildlife species populations, therefore measurements of available habitat will continue to be used in conjunction with known territory sizes for resident species and any available population data as a viability analysis, until further directed. Otherwise this issue is beyond the scope of this project.*
3	Ruggerio et al. 1998.	Wildlife	Citation used by The Lands Council as basis for pine marten conservation strategies. *Pine marten is currently not an MIS for the KNF nor is it listed for the KNF as a T, E, or S species. It was not specifically addressed in the DSEIS.*
3	Ruggerio 2007. (validity of models)	Wildlife	This citation was used by the Lands Council in their challenge of the validity of the KNF developed wildlife habitat models. *While the models themselves are unpublished, the scientific documents used to establish the habitat parameters for the models have been peer reviewed.*

Letter #	Author/Date/Title	Where Located in Project File	Comments
3	Schloeder 2001a. and 2001b.	Wildlife	Reports used by Lands Council claiming that the "FS's methodology is inadequate to demonstrate that 'designated effective' old growth on the KNF is meeting old-growth wildlife species' viability needs. *The KNF has shown in court that it is meeting FP standards for old-growth, which, is currently established at 10% as indicated in the FP.*
3	Sullivan et al 2006. (validity of models)	Wildlife	This citation was used by the Lands Council in their challenge of the validity of the KNF developed wildlife habitat models. *While the models themselves are unpublished, the scientific documents used to establish the habitat parameters for the models have been peer reviewed.*
3	Suring etal.1993.	Wildlife	Used by Lands Council to point out management strategies that are available to the KNF for the northern goshawk and the need for a 20 to 50% old-growth level needed for goshawk nesting. *Currently the FP standard for MA 13, designated old-growth is 10% , which does not include undesignated old growth stands. Other science is currently being used for this species which indicates goshawks use a variety of forest types other than old-growth (Brewer 2009).*

Letter #	Author/Date/Title	Where Located in Project File	Comments
3	Thomas et al. 1979.	Wildlife	Referred to by Lands Council to discuss the minimal viability threshold of 40% for persistence of wildlife species. *Applicable and used in this analysis along with other science that was based in the Northern Region. Also used in conjunction with snag data collected locally from the Fortine Ranger District to help establish new snag retention standards exceeding the minimal requirements recommended by Thomas etal 1979..*
3	USDA Forest Service 1987. Forest Plan II-23.	Wildlife	Used by Lands Council to discuss where/when treatment units greater than 40 acres are acceptable according to the plan. *The Young Dodge DSEIS has requested an exemption from this standard in order to better meet the purpose and need for this project. Approval from the Regional Office is pending.*
3	USDS Forest Service. 1990.	Wildlife	Citation used by The Lands Council as basis for pine marten conservation strategies. Also used by Lands Council to point out management strategies that are available to the KNF for the northern goshawk. *Applicable to and used as part of this analysis. Pine marten was not specifically addressed in DSEIS, nor is it a sensitive or MIS, however effects to snags and down woody debris were analyzed.*
3	USDA Forest Service 1993.	Wildlife	Used by Lands Council to discuss the diversity of habitats used by the wolverine and their use of mid to low elevation Douglas-fir forests. *Not used, however, consistent with other science utilized to maintain consistency among other analyses on the KNF.*

Letter #	Author/Date/Title	Where Located in Project File	Comments
3	USDA Forest Service 2000b.	Wildlife	Used by Lands Council to point out management strategies that are available to the KNF for the northern goshawk. *Applicable, however, other science used for Young Dodge analysis to maintain consistency with other analyses on the KNF.*
3	USDA Forest Service 2000c.	Wildlife	Used by the Lands Council to challenge the use of the TSMRS data base to help determine old growth stands and associated elements including snags, down wood. *The TSMRS data base is used in conjunction with data specifically collected for the KNF which is considered the best information available.*
3	USDA Forest Service 2003a. Bristow Area Res. Project EA; KNF	Wildlife	Used by Lands Council to discuss the habitats and life-cycle of the boreal toad. *Consistent with other science used for the basic habitat needs and biology of the boreal (western) toad (Maxell 2000).*
3	USDA Forest Service 2004. Lower Big Creek DEIS	Wildlife	Citation used by the Lands Council to point out deficiencies in snags on the Rexford R.D. *The TSMRS data base is used in conjunction with data specifically collected for the KNF which is considered the best information available. Current modeling considers 100 feet from all roads to provide a conservative "0" percent snag capability.*

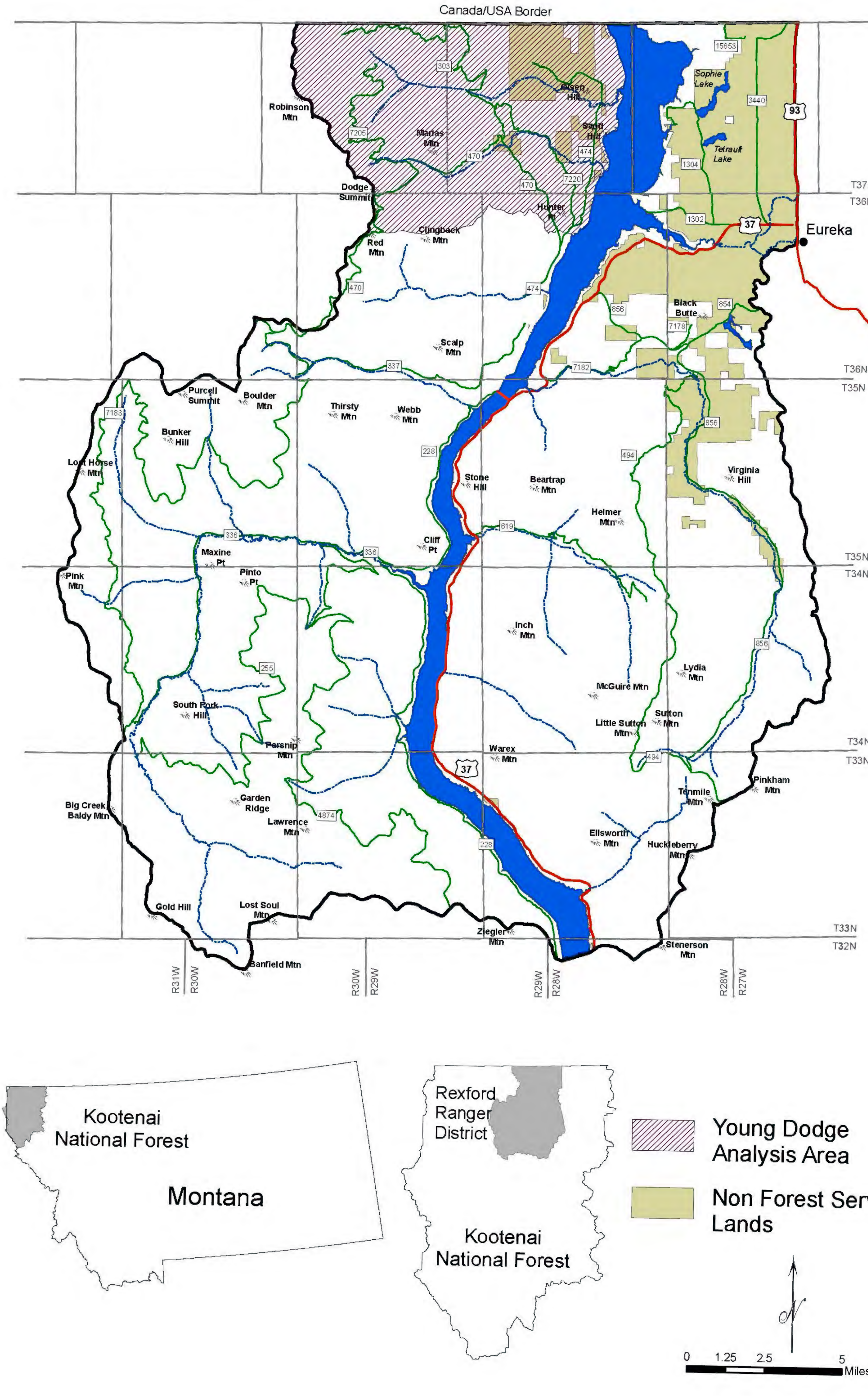
Letter #	Author/Date/Title	Where Located in Project File	Comments
3	USDA Forest Service 2004a.	Wildlife	Used by Lands Council to emphasize the effects of forest edge and fragmentation on wildlife species especially those associated with interior habitats (linkages, gene exchange, population dynamics, viability). *Consistent with other science (Askins 2000, Chen etal 1995, Russell and Jones 2000) demonstrating the edge effects on interior habitats and old growth used for this analysis. Other research was used to maintain the consistency between analyses on the KNF.*
3	USDA Forest Service 2006c.	Wildlife	Used by Lands Council to discuss the currently known goshawk nesting territories for the KNF. *Applicable and also referred to in the analysis for both the DEIS and DSEIS for Young Dodge.*
3	Widen 1989.	Wildlife	Used by Lands Council to discuss canopy closures needed by goshawks (nesting, hunting). *General recommendations of this study are applicable, however, study was conducted in Sweden. Other research was used for the Young Dodge analysis in order to maintain consistency among analyses on the KNF.*
3	Wilcove et al. 1986.	Wildlife	Used by Lands Council to emphasize the effects of forest edge and fragmentation on wildlife species especially those associated with interior habitats and old growth. *Consistent with other science (Askins 2000, Chen etal 1995, Russell and Jones 2000) demonstrating the edge effects on interior habitats and old growth used for this analysis. Other research was used to maintain the consistency between analyses on the KNF.*

Letter #	Author/Date/Title	Where Located in Project File	Comments
3	Witmer et al. 1998.	Wildlife	Citation used by The Lands Council as basis for fisher conservation strategies and population status. *Consistent with other science used for Young Dodge analysis including Heinmeyer and Jones 1994.*
3	Wright et al/ 1997.	Wildlife	Used by Lands Council to point out the correct habitat type for the flammulated owl rather than any ponderosa pine stands. *Consistent with other science used for the flammulated owl including Hayward and Verner 1994.*
3	Zack et al. 1997.	Wildlife	Used by Lands Council as an example for a landscape management plan for the conservation of wildlife species, especially those associated with old-growth. *Although science applicable to the local landscape, it needs to be applied and directed at the Forest scale and incorporated into the Forest Plan.*
3	Zielinski and Stauffer 1996.	Wildlife	Used by Lands Council as a suggestion for information on surveying fisher. *Consistent with other science used for Young Dodge analysis including Heinmeyer and Jones 1994.*

The following describes the process used to obtain copies of cited references:

1. The author of the letter(s) were contacted via phone or email and asked to provide the references in their letter(s).
2. The internet was extensively searched for those references not provided by the letter authors.

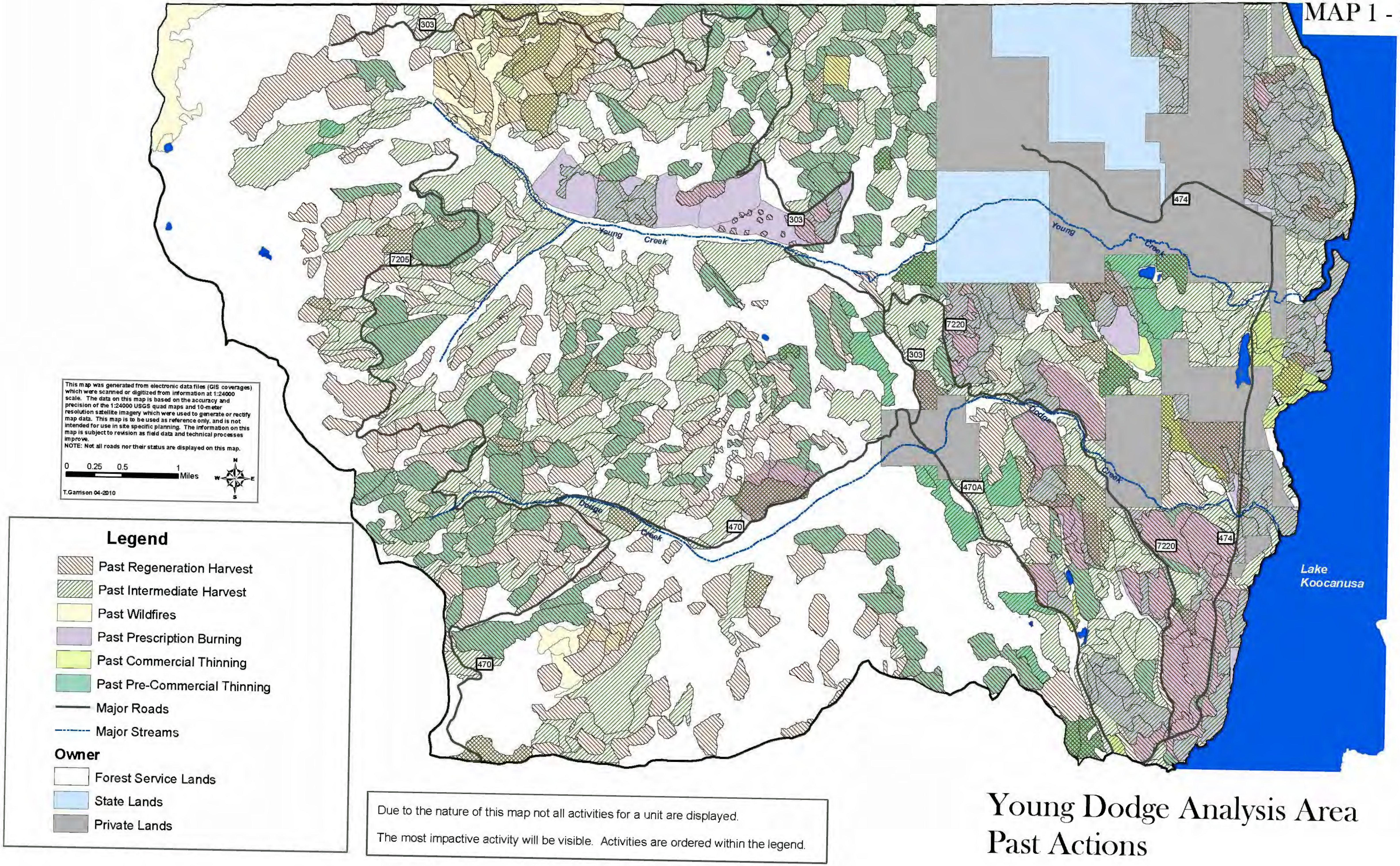
If all the above failed a copy of the reference was not obtained.



Canada/USA Border
Robinson Mtn
Marias Mtn
Olsen Hill
Sand Hill
Sophie Lake
Tetrault Lake
Dodge Summit
Hunter Pt
Clingback Mtn
Red Mtn
Eureka
Black Butte
Scalp Mtn
Purcell Summit
Boulder Mtn
Thirsty Mtn
Webb Mtn
Bunker Hill
Lost Horse Mtn
Stone Hill
Beartrap Mtn
Helmer Mtn
Virginia Hill
Cliff Pt
Maxine Pt
Pinto Pt
Pink Mtn
Inch Mtn
Lydia Mtn
McGuire Mtn
South Fork Hill
Little Sutton Mtn
Sutton Mtn
Parsnip Mtn
Warex Mtn
Pinkham Mtn
Tenmile Mtn
Big Creek Baldy Mtn
Garden Ridge
Lawrence Mtn
Ellsworth Mtn
Huckleberry Mtn
Gold Hill
Lost Soul Mtn
Ziegler Mtn
Stenerson Mtn
Banfield Mtn
T37N
T36N
T35N
T34N
T33N
T32N
R31W
R30W
R29W
R28W
R27W
15653
3440
93
303
7205
470
474
7220
1304
1302
37
856
854
7178
7182
337
7183
228
494
619
336
255
4874
Kootenai National Forest
Montana
Rexford Ranger District
Young Dodge Analysis Area
Non Forest Service Lands
0
1.25
2.5
5
Miles

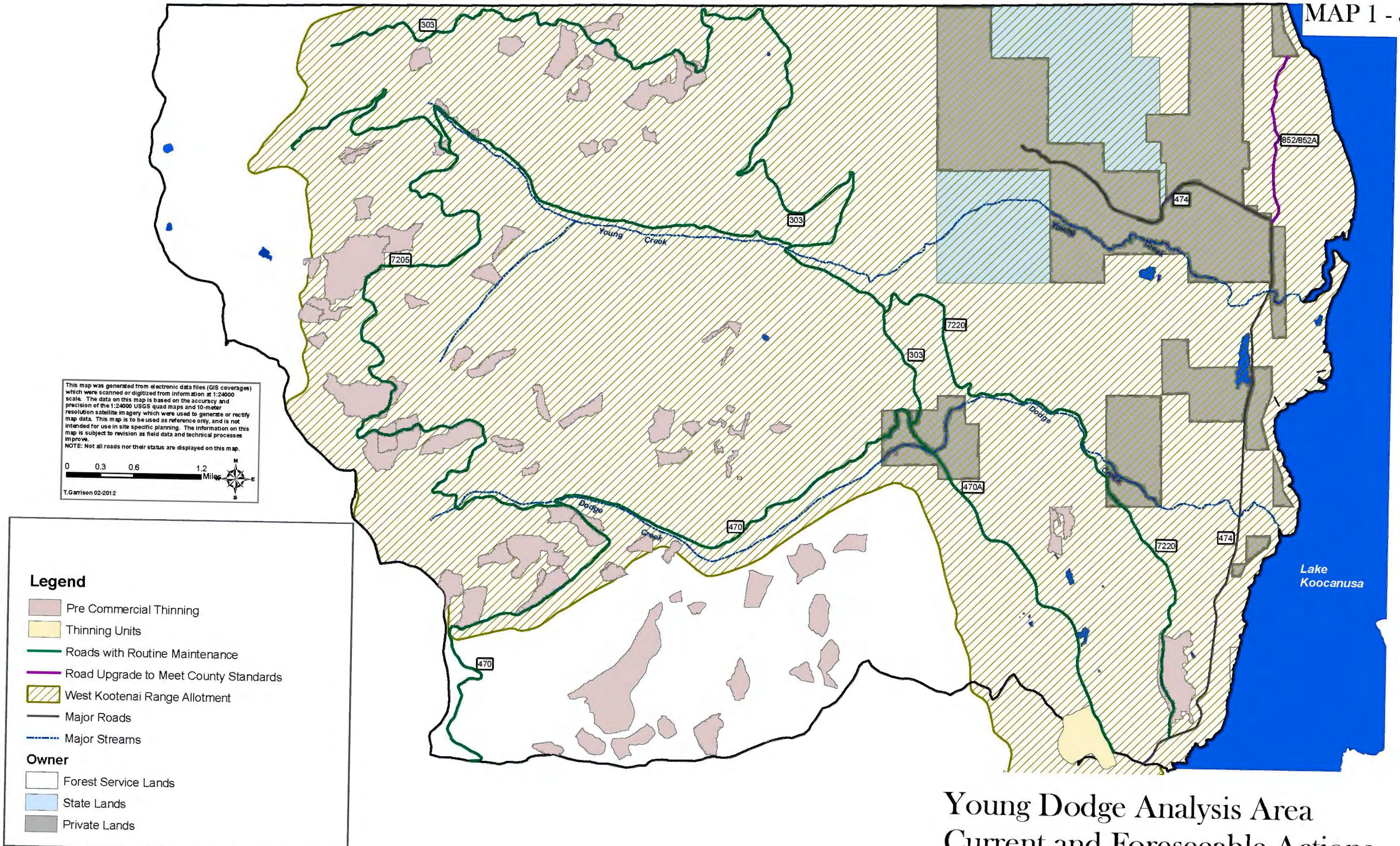
MAP 1-1

MAP 1 - 2



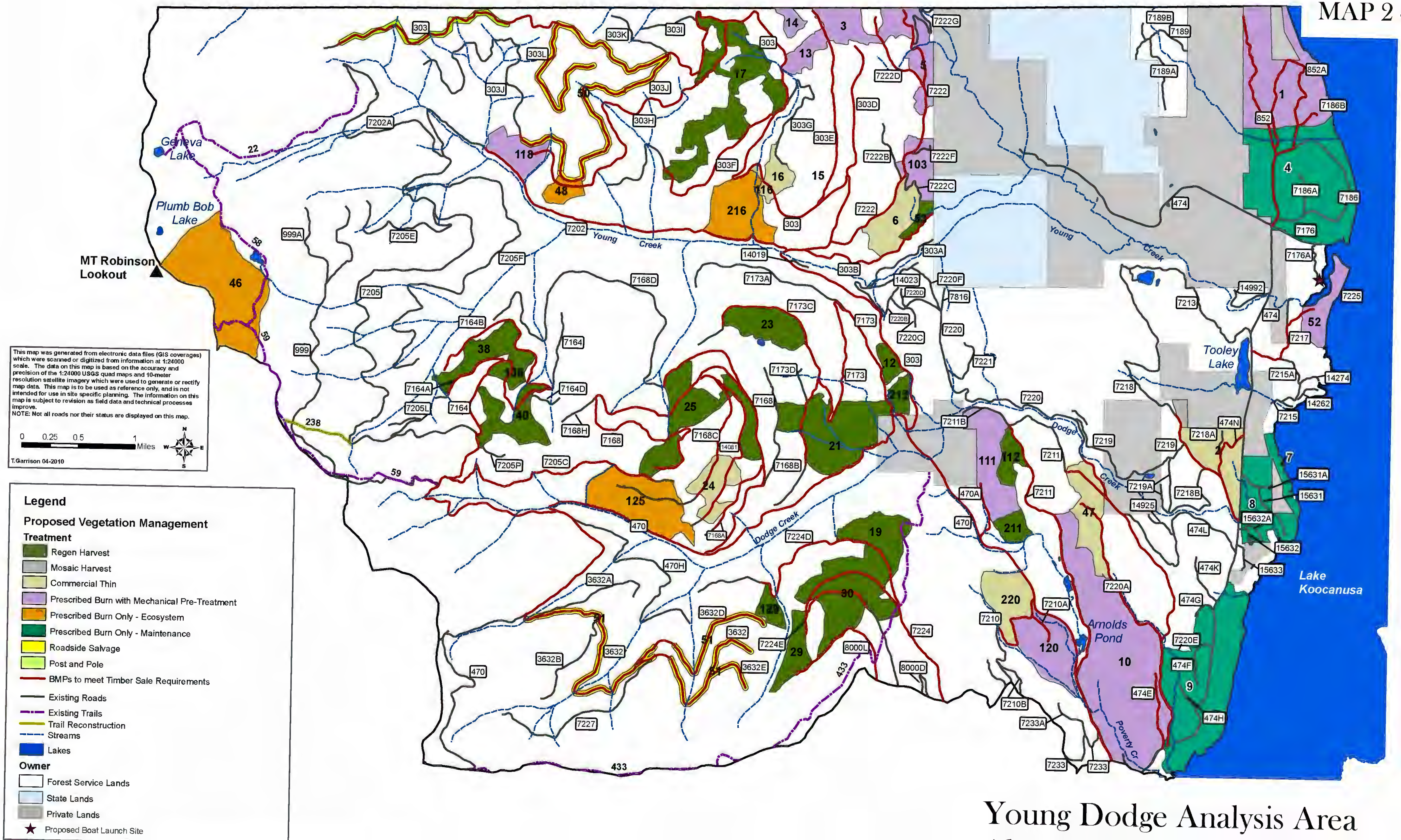
Young Dodge Analysis Area Past Actions

MAP 1 - 3

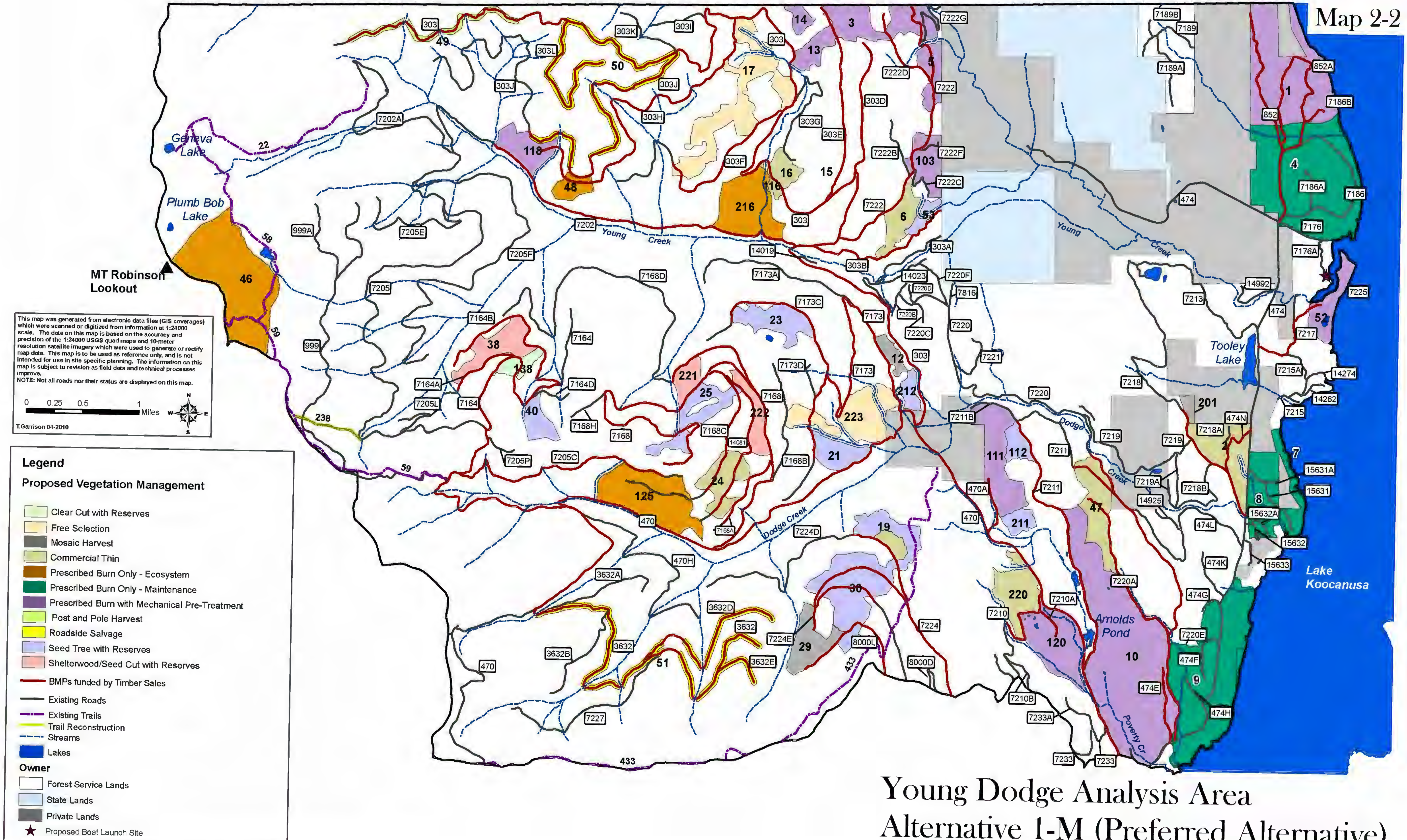


Young Dodge Analysis Area
Current and Foreseeable Actions

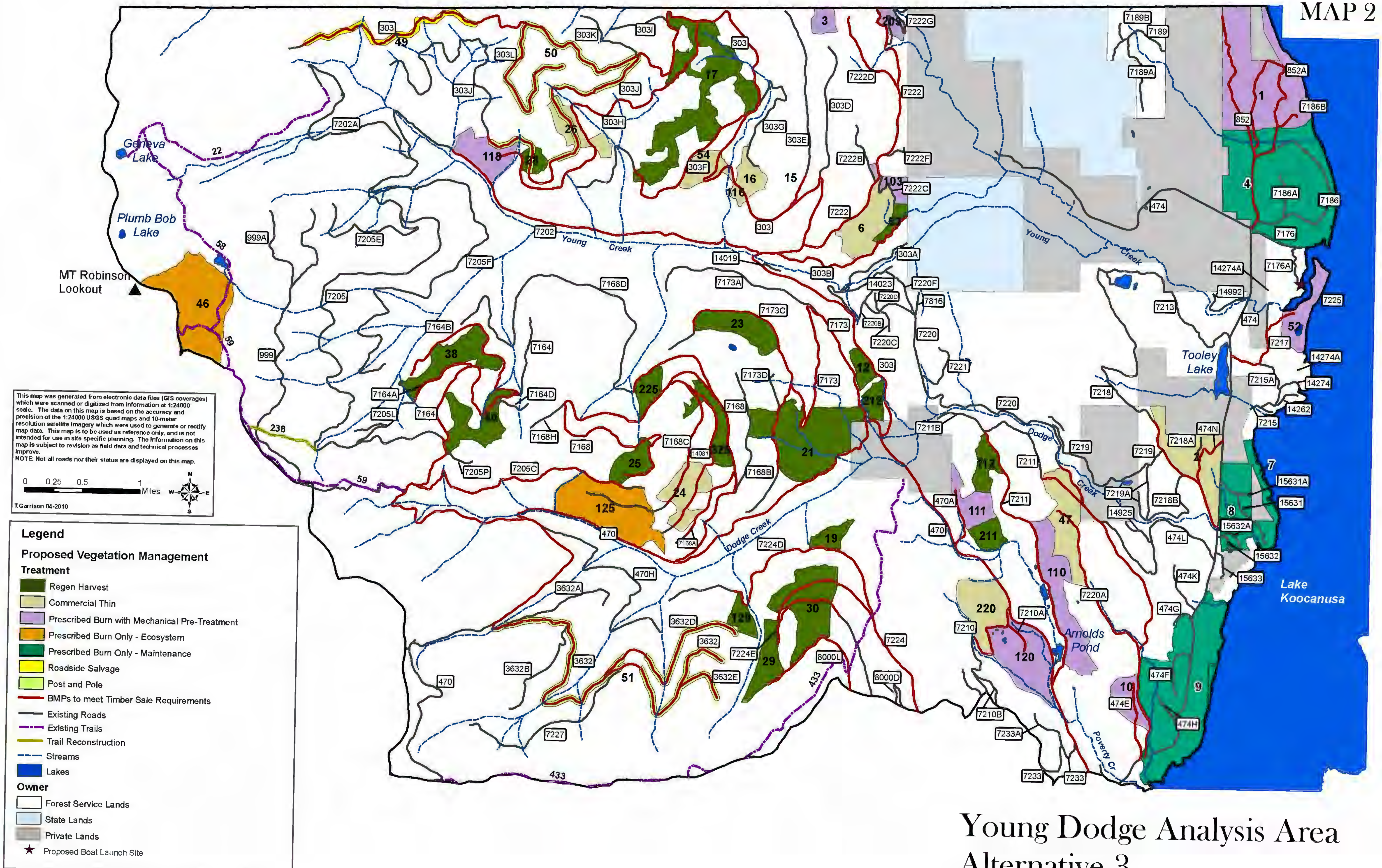
MAP 2 - 1



Young Dodge Analysis Area
Alternative 1 (Proposed Action)

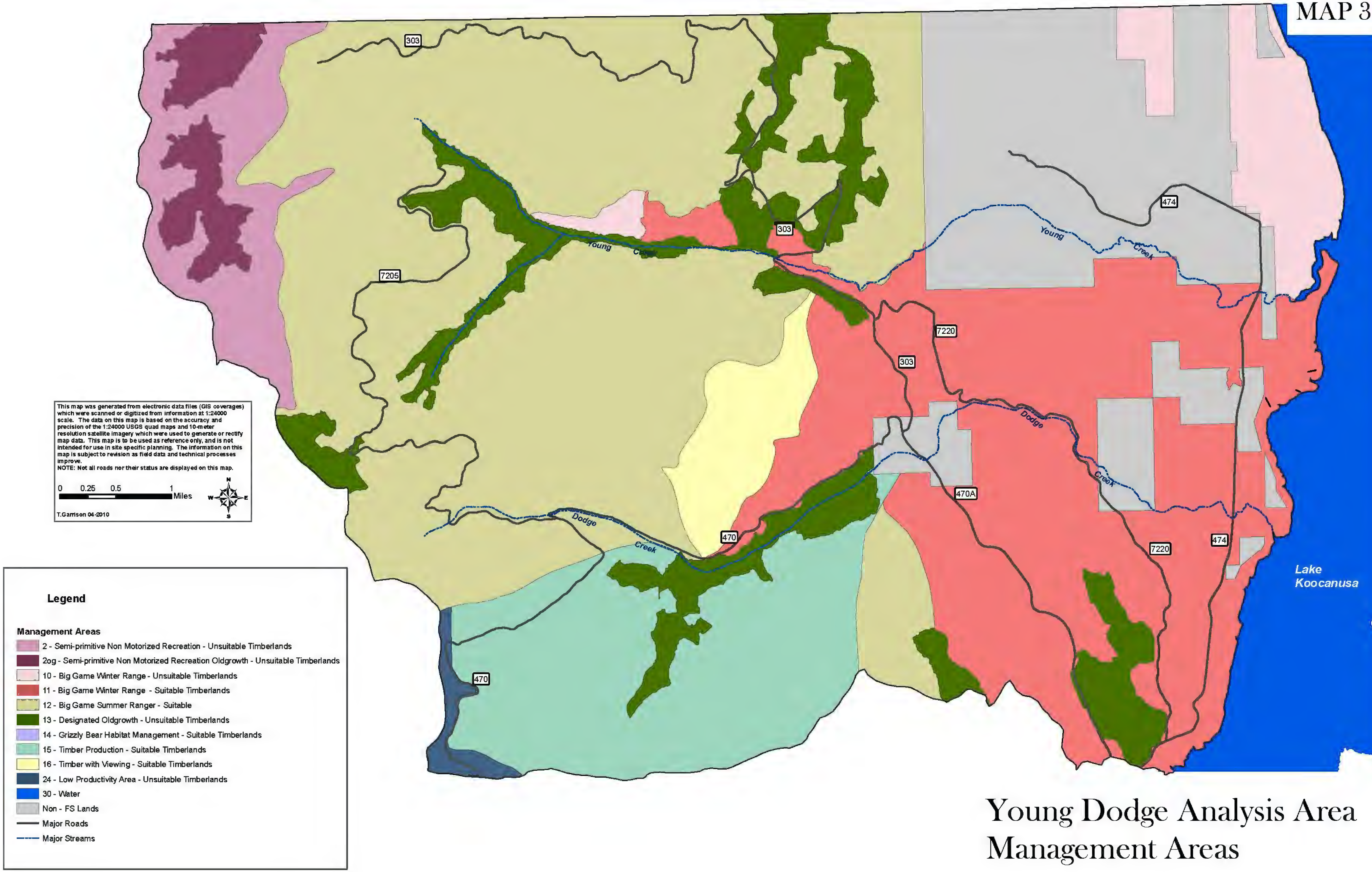


Young Dodge Analysis Area
Alternative 1-M (Preferred Alternative)



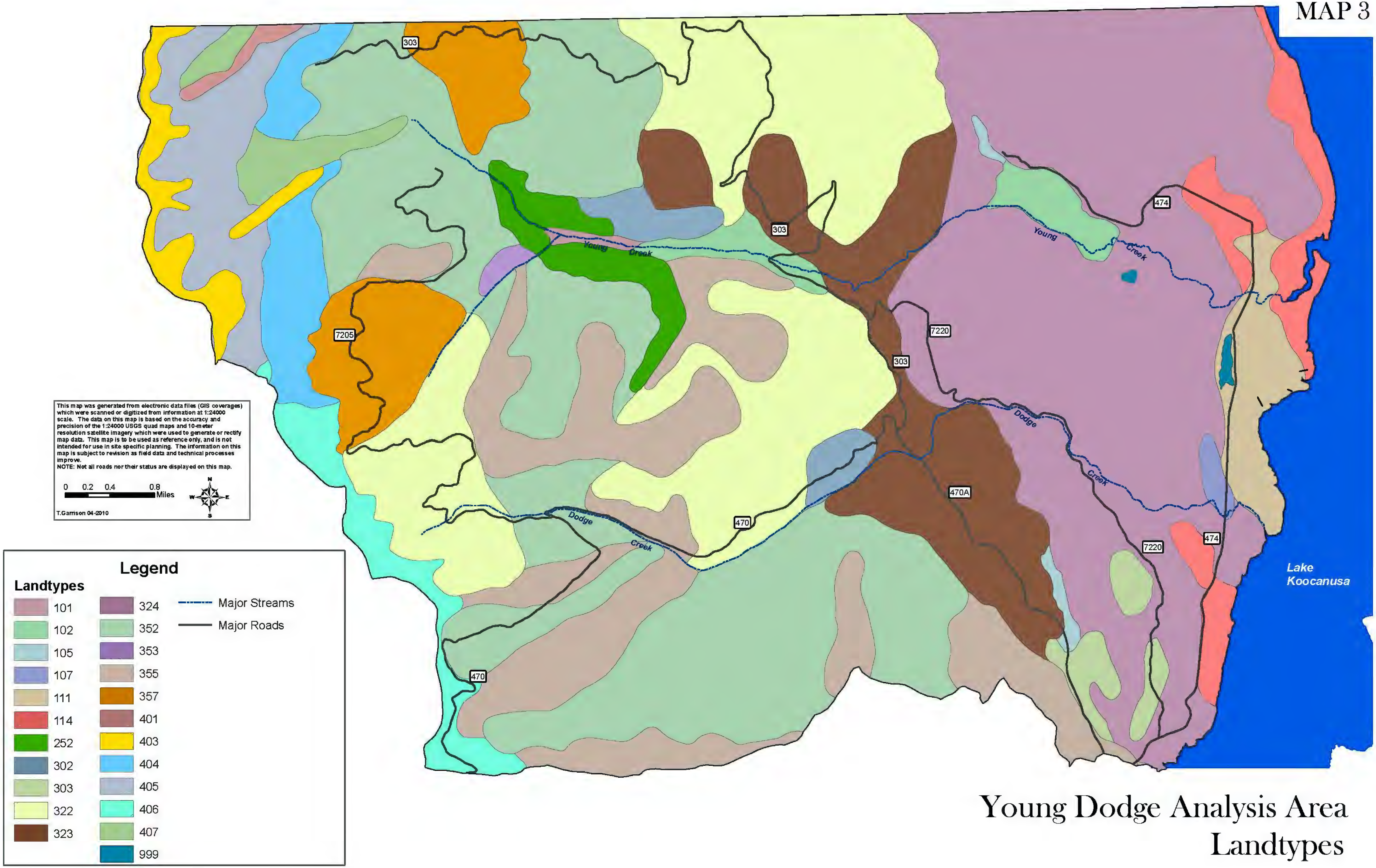
Young Dodge Analysis Area
Alternative 3

MAP 3 - 1



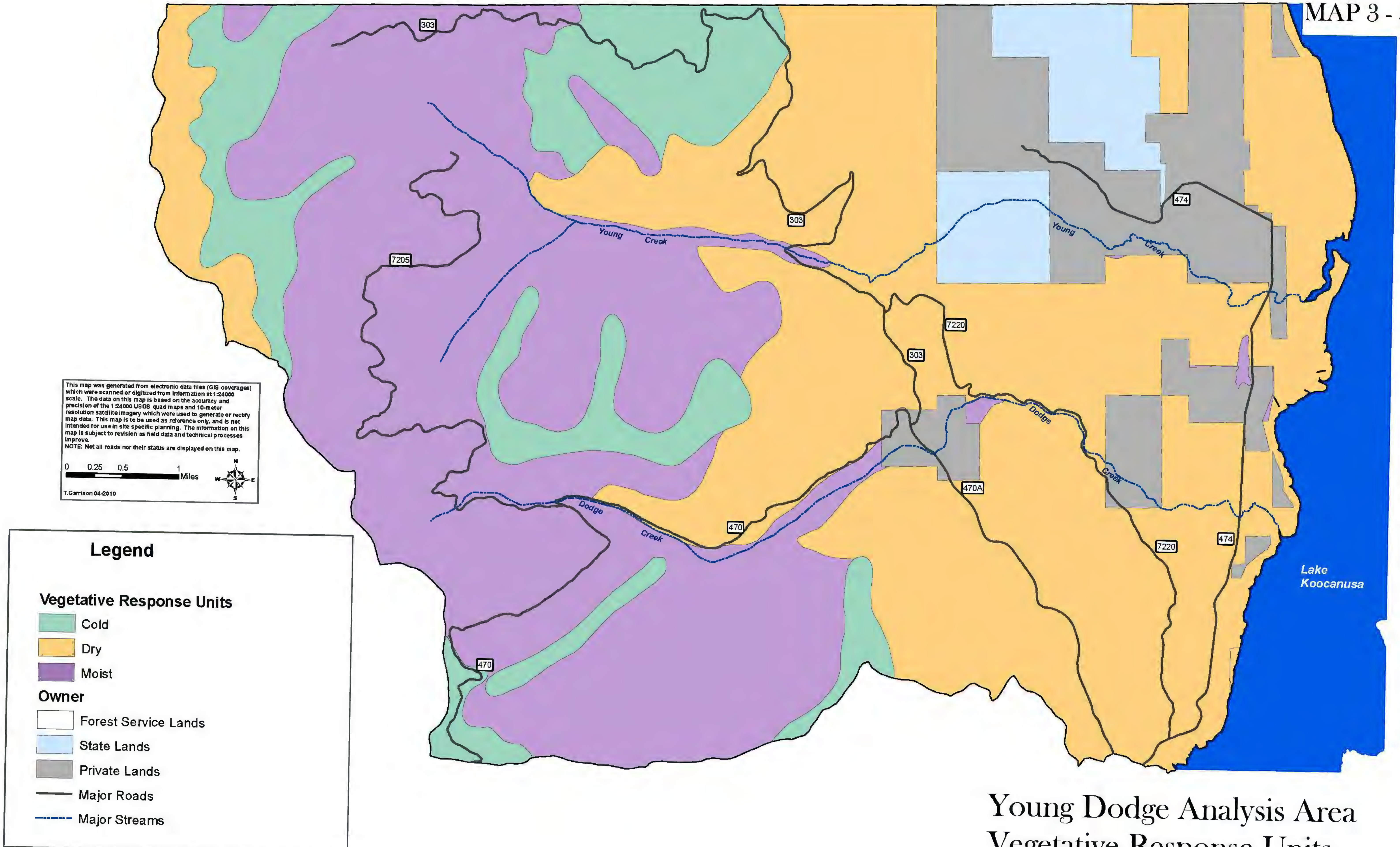
Young Dodge Analysis Area Management Areas

MAP 3 - 2



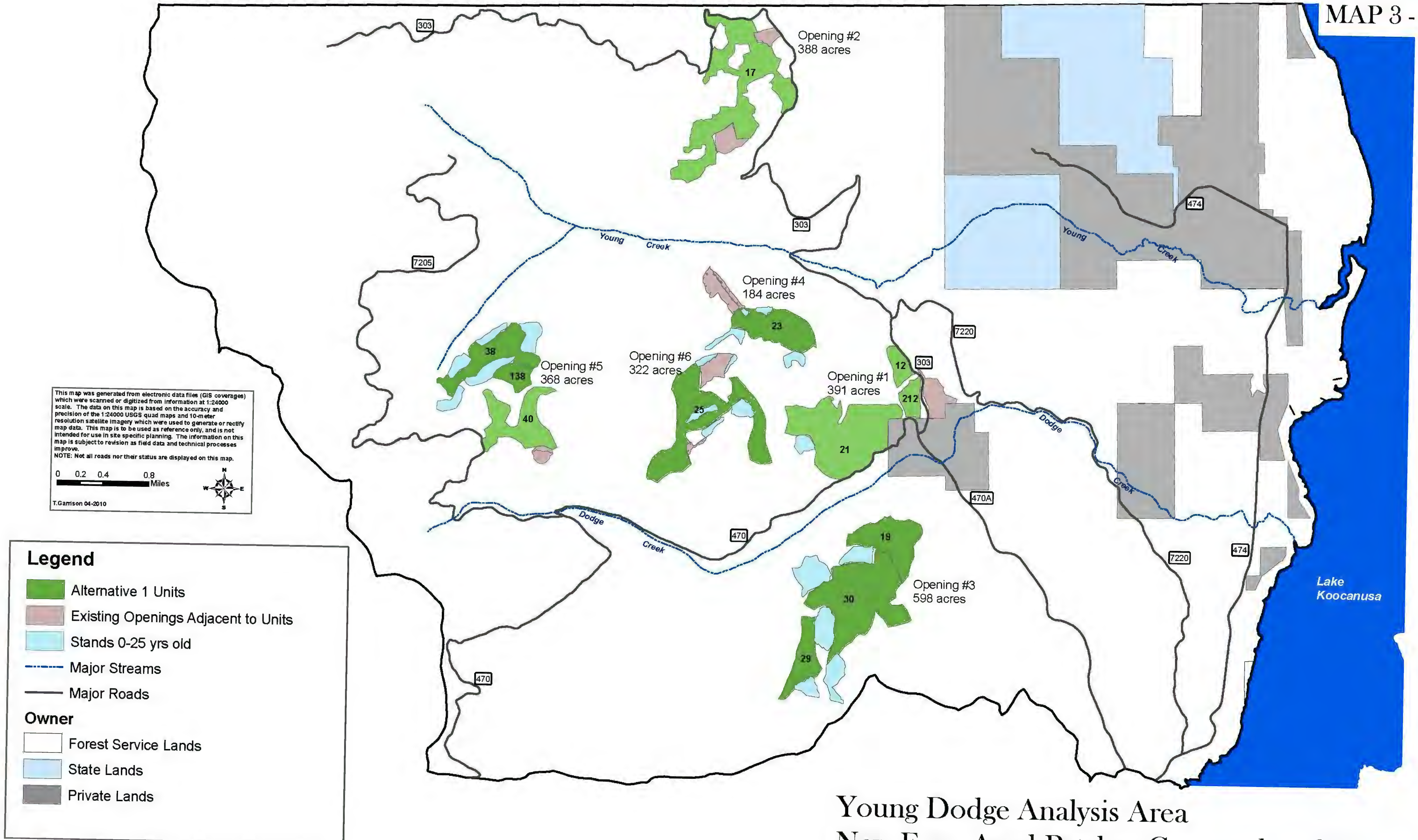
Young Dodge Analysis Area
Landtypes

MAP 3 - 3



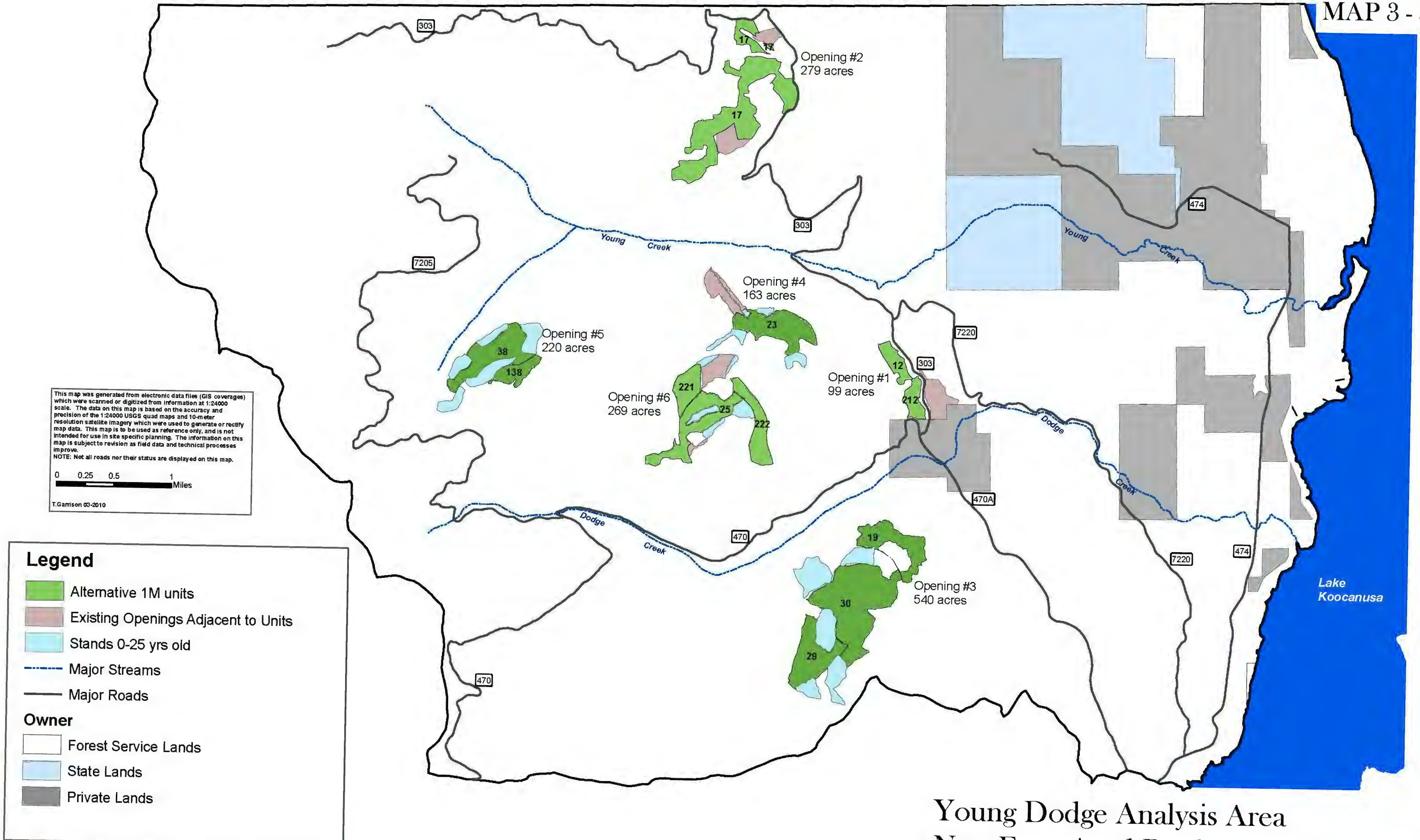
Young Dodge Analysis Area
Vegetative Response Units

MAP 3 - 4



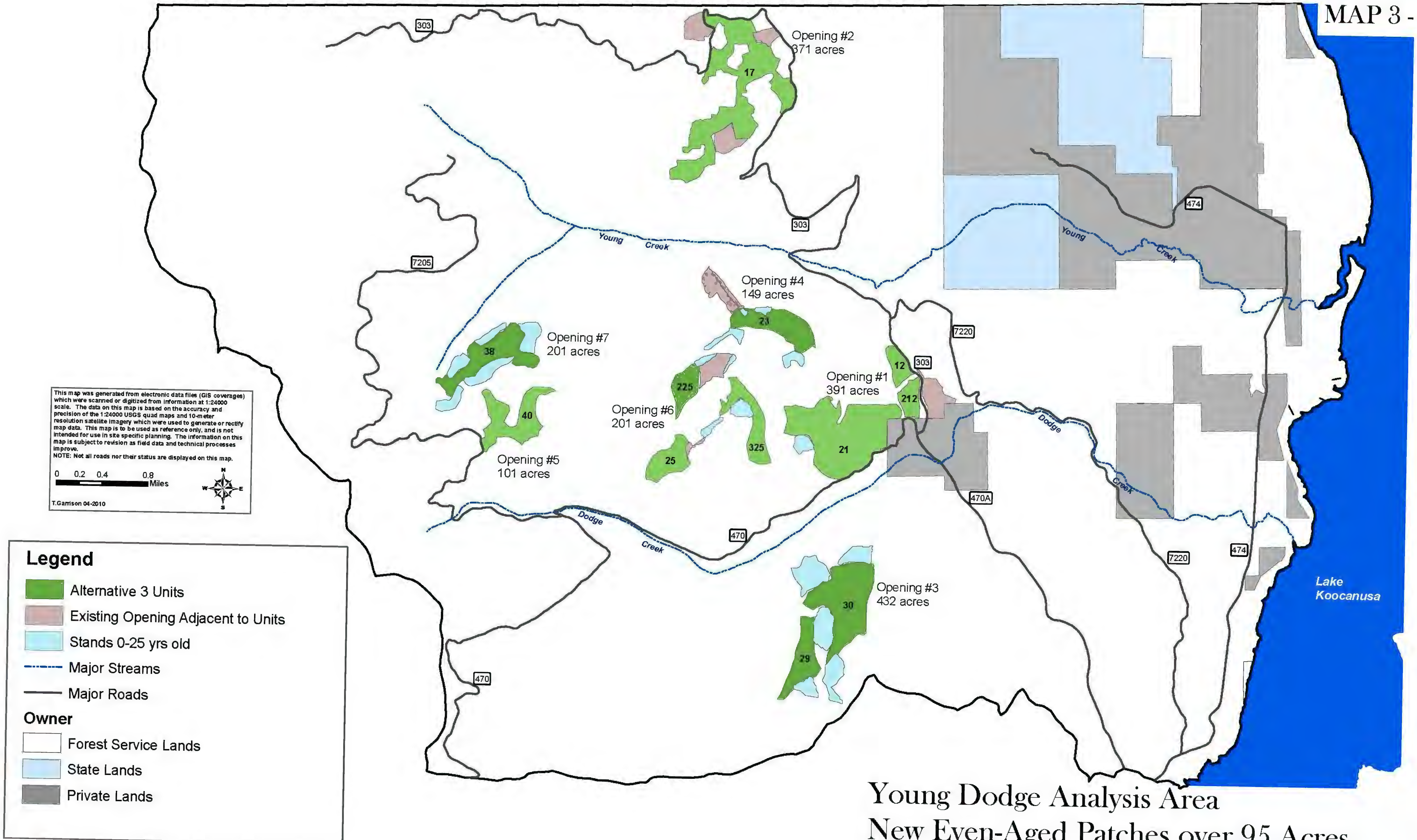
Young Dodge Analysis Area
New Even-Aged Patches Greater than 95 Acres
Alternative 1

MAP 3 - 5

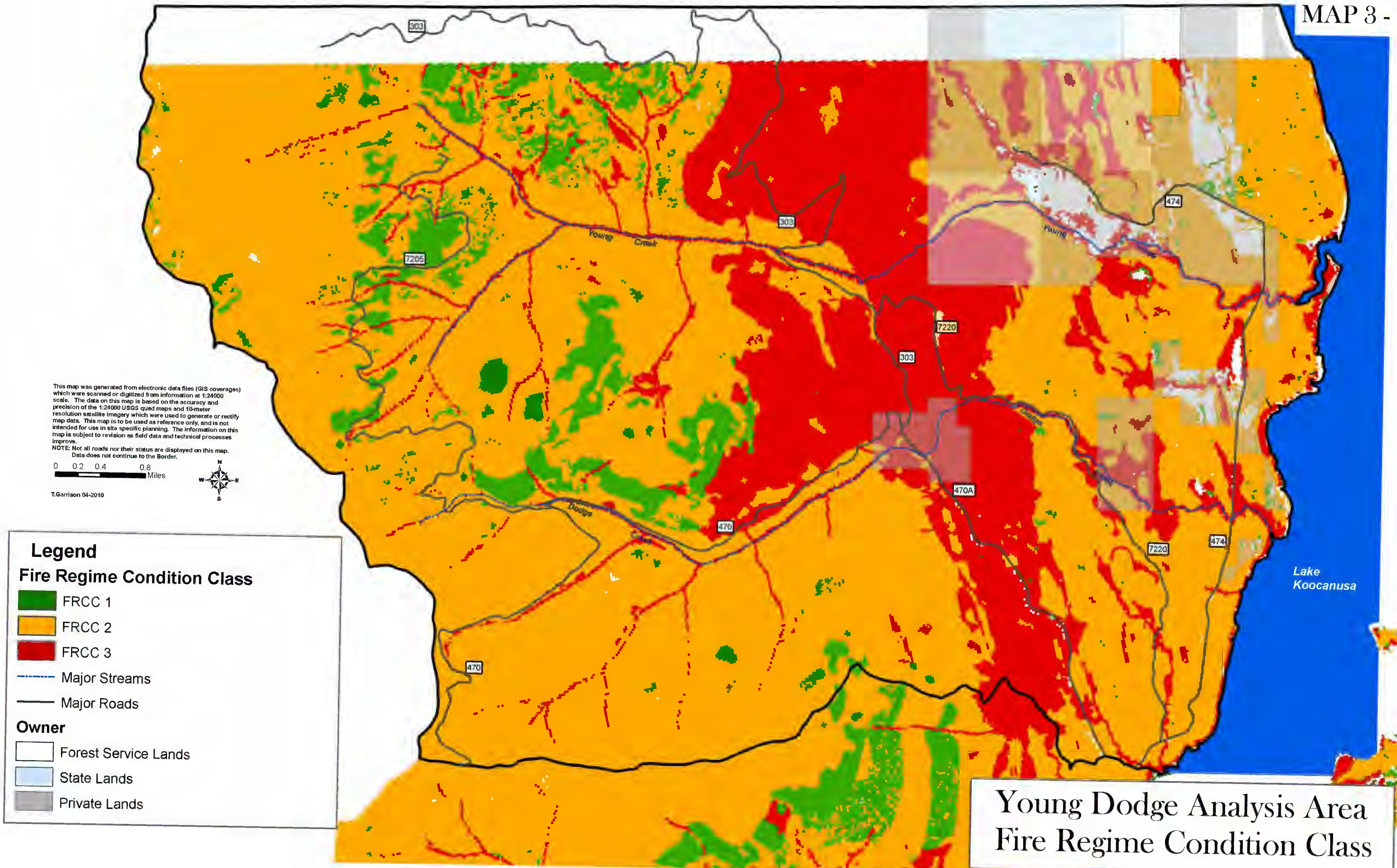


Young Dodge Analysis Area
New Even-Aged Patches over 95 Acres
Alternative 1 M

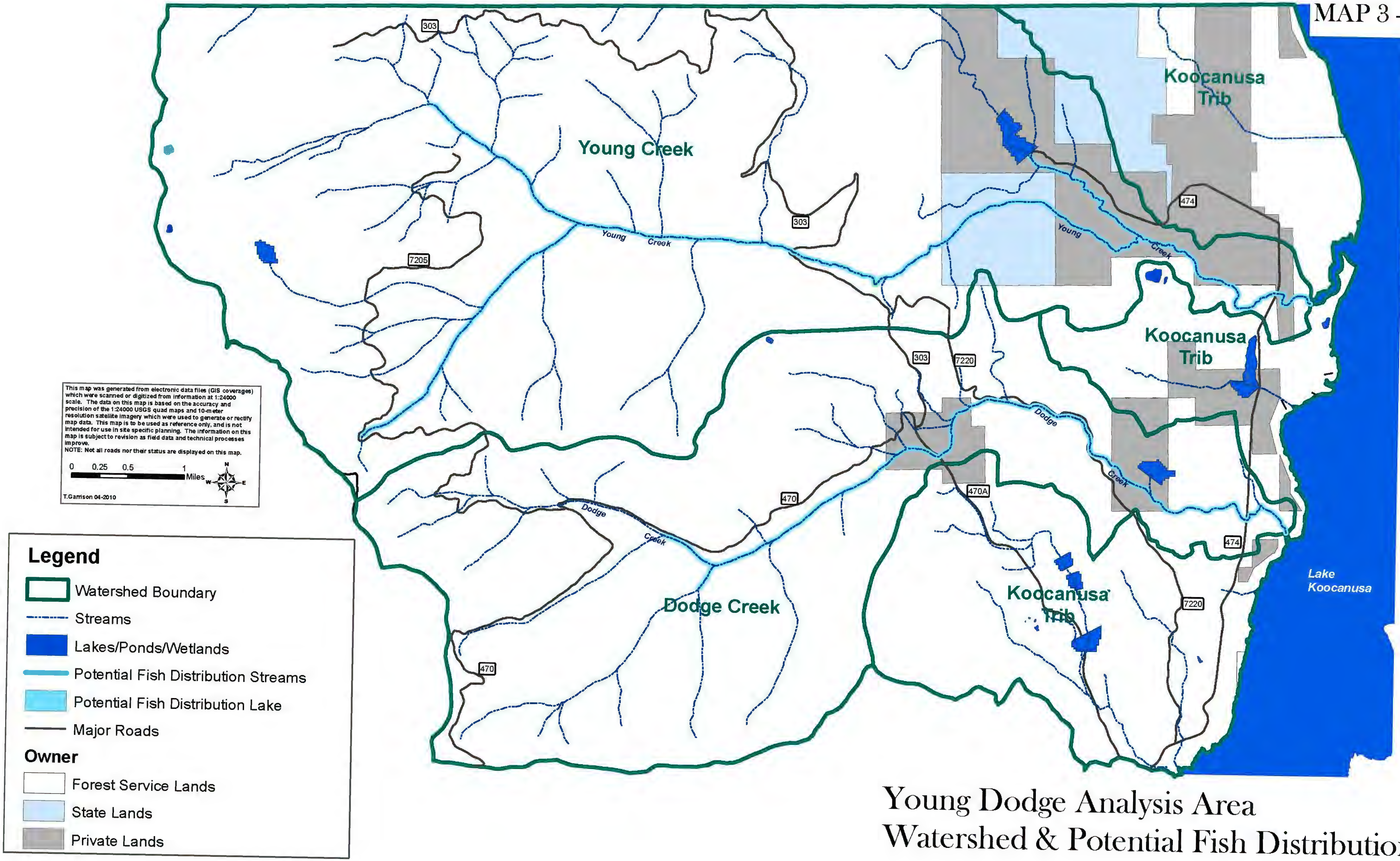
MAP 3 - 6



Young Dodge Analysis Area
New Even-Aged Patches over 95 Acres
Alternative 3

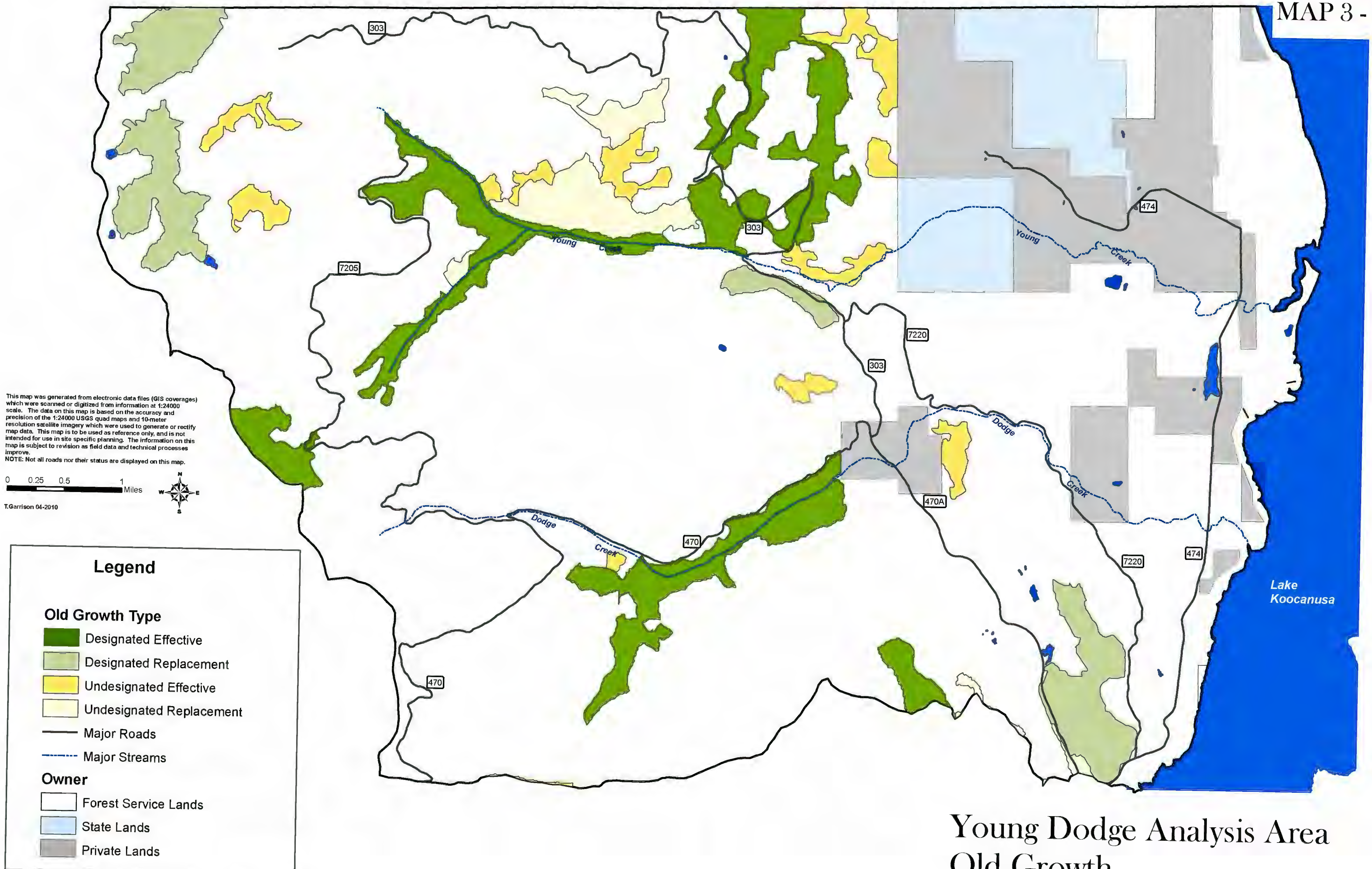

Young Dodge Analysis Area
Fire Regime Condition Class
Legend
Fire Regime Condition Class
FRCC 1
FRCC 2
FRCC 3
Major Streams
Major Roads
Owner
Forest Service Lands
State Lands
Private Lands
This map was generated from electronic data files (GIS coverages) which were scanned or digitized from information at 1:24000 scale. The data on this map is based on the accuracy and precision of the 1:24000 USGS quad maps and 10-meter resolution satellite imagery which were used to generate or rectify map data. This map is to be used as reference only, and is not intended for use in site specific planning. The information on this map is subject to revision as field data and technical processes improve.
NOTE: Not all roads nor their status are displayed on this map.
Data does not continue to the Border.
0 0.2 0.4 0.8 Miles
N
W
E
S
T.Garrison 04-2010
Lake Koocanusa
Young Creek
Dodge
303
7205
474
7220
470
470A

MAP 3 - 8



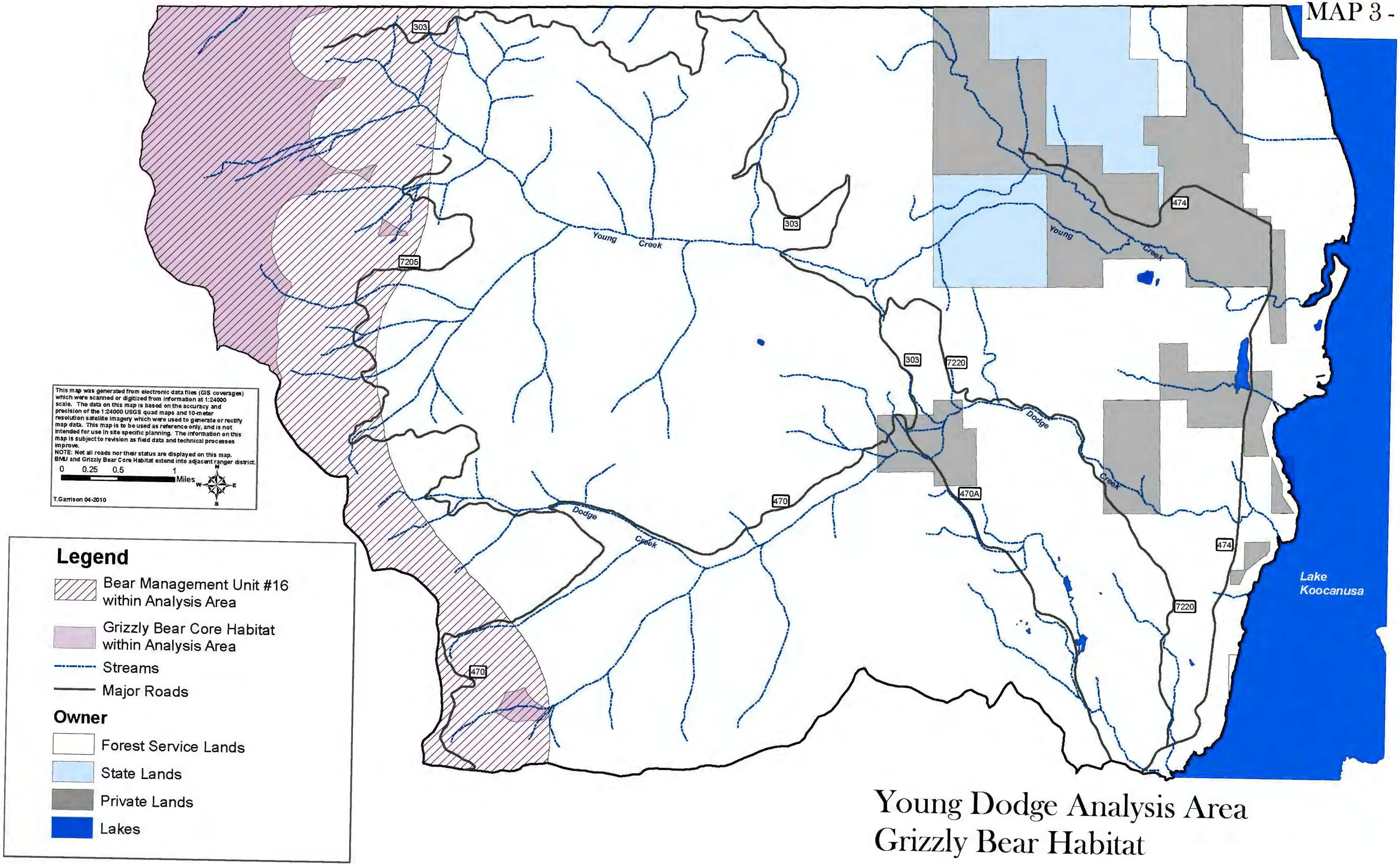
Young Dodge Analysis Area
Watershed & Potential Fish Distribution

MAP 3 - 9



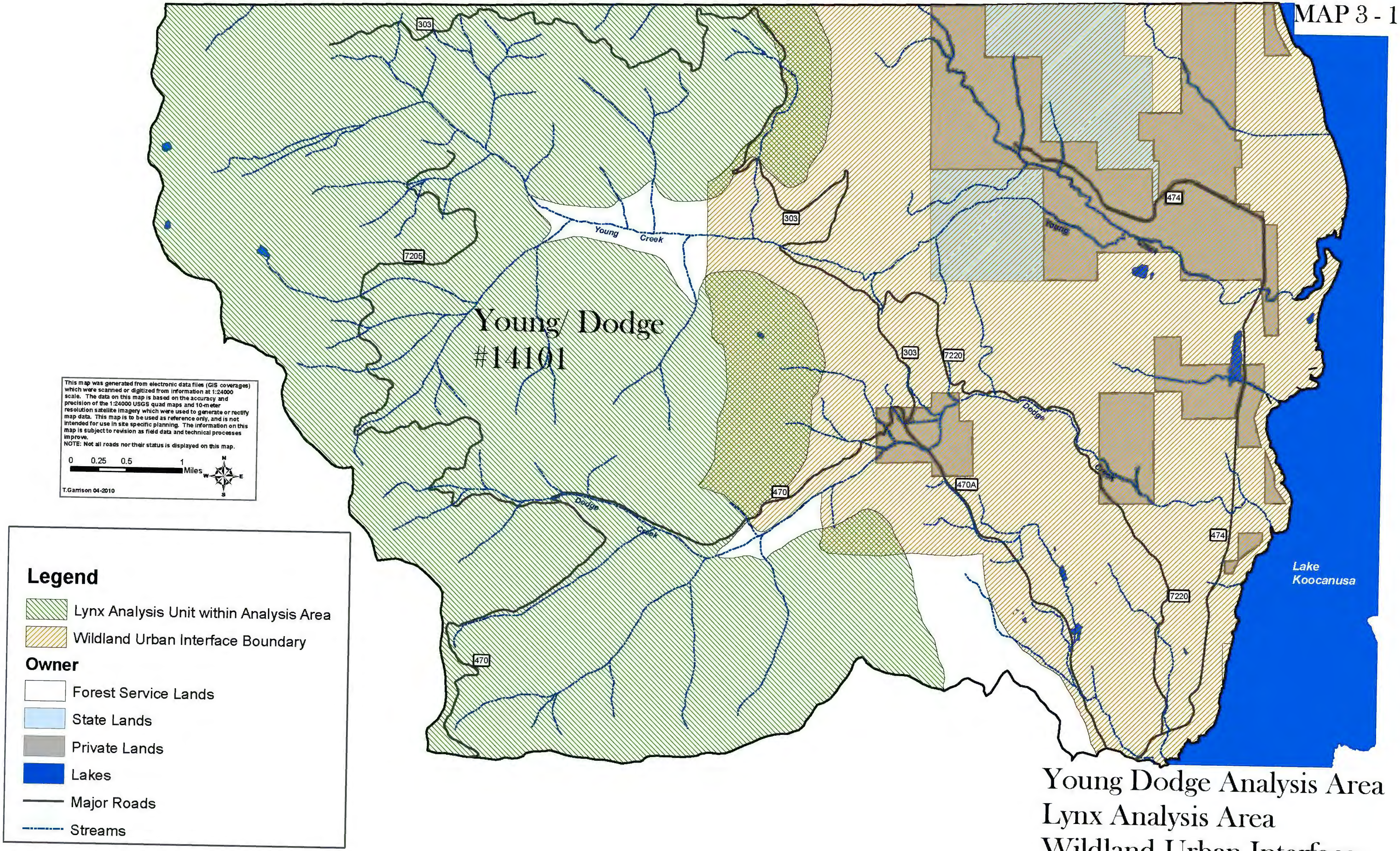
Young Dodge Analysis Area Old Growth

MAP 3 - 10



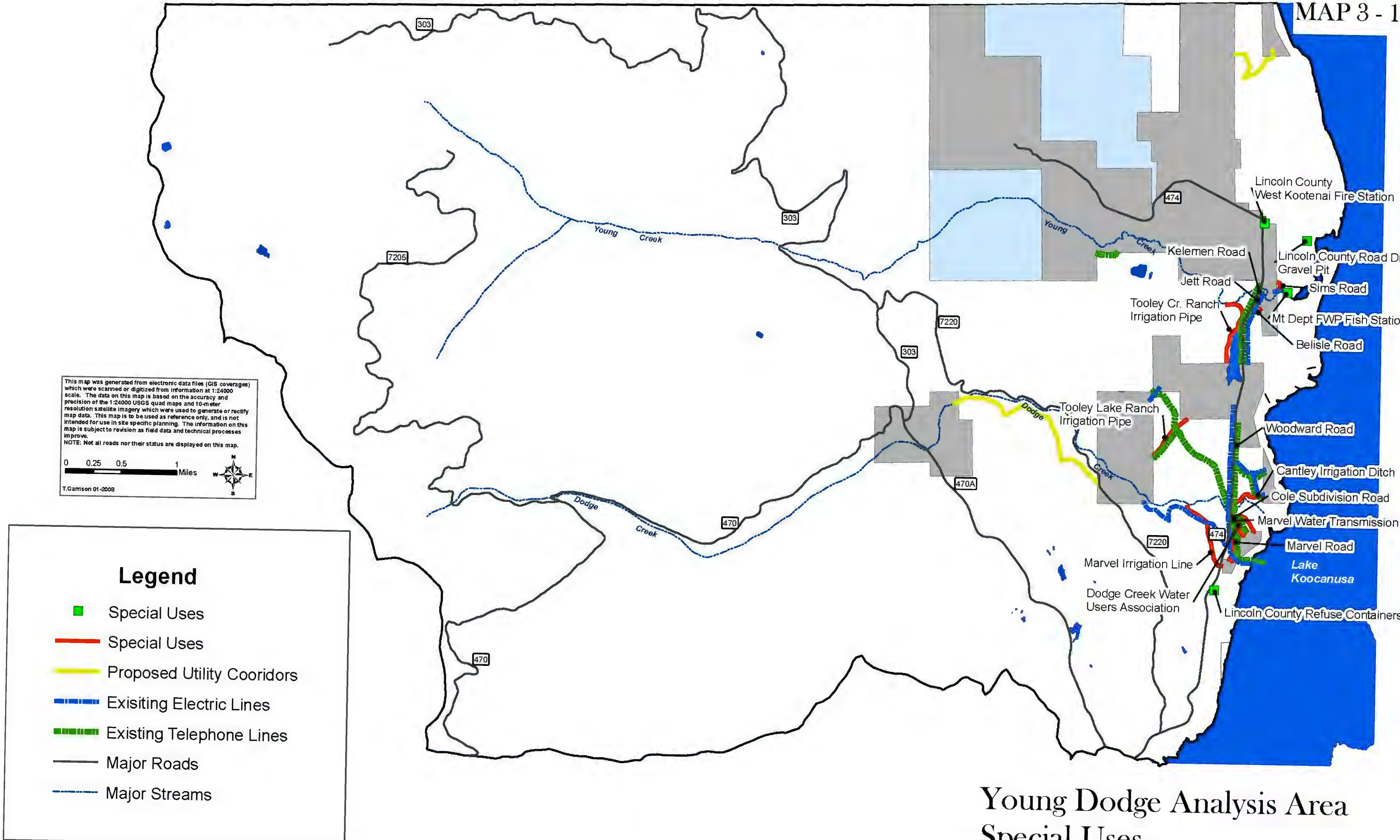
Young Dodge Analysis Area
Grizzly Bear Habitat

MAP 3 - 11

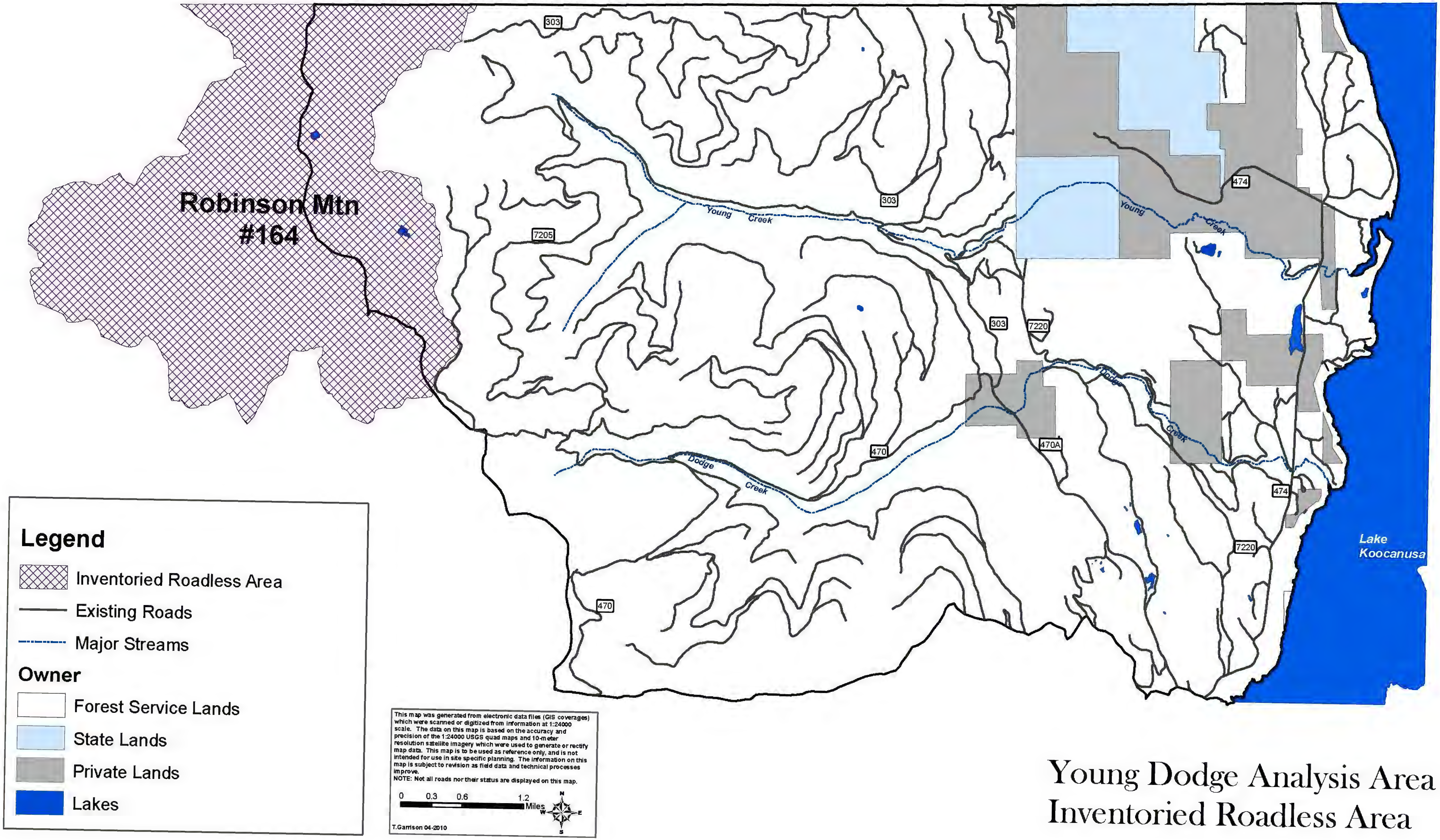


Young Dodge Analysis Area
Lynx Analysis Area
Wildland Urban Interface

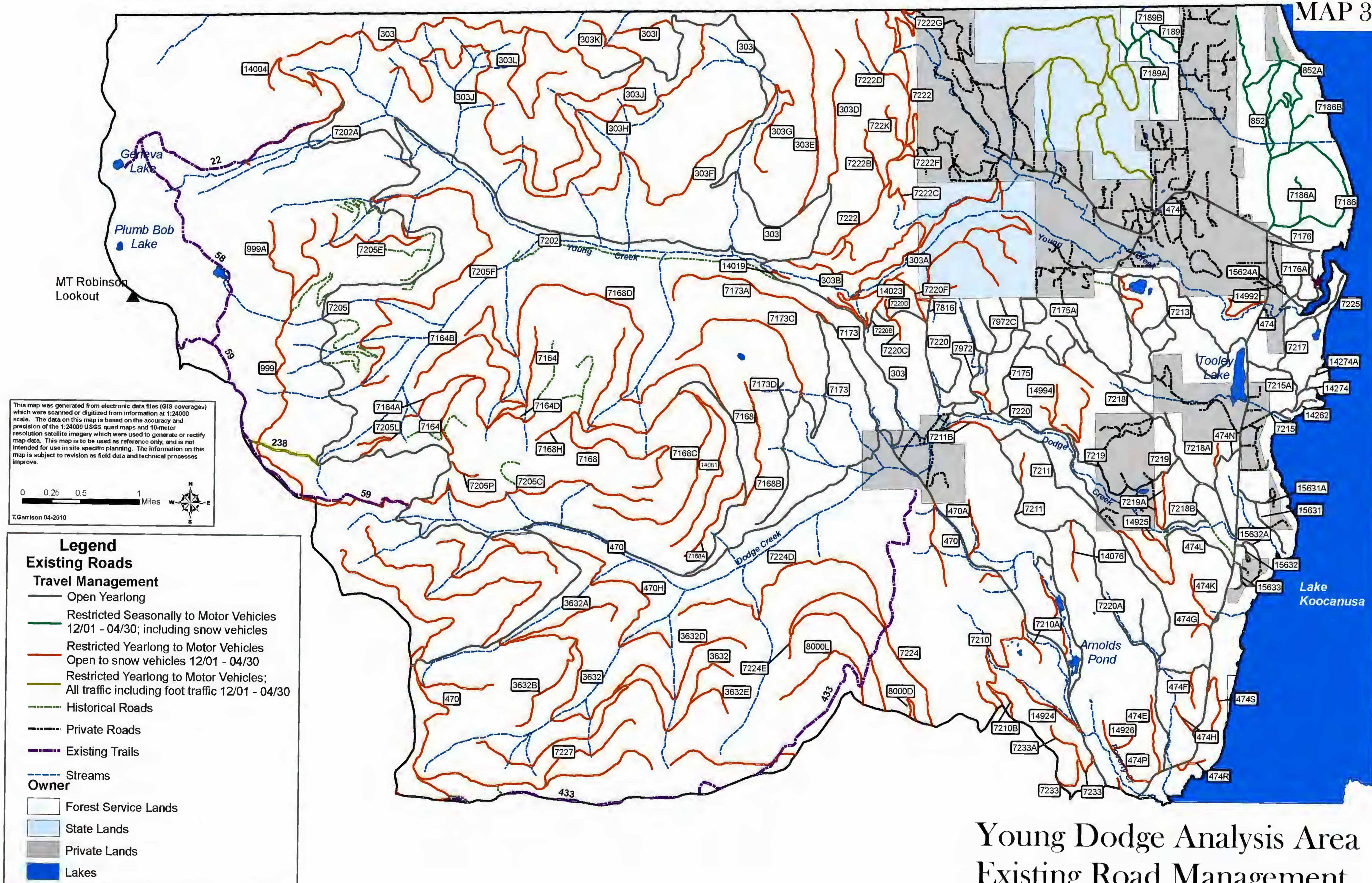
MAP 3 - 12



Young Dodge Analysis Area Special Uses

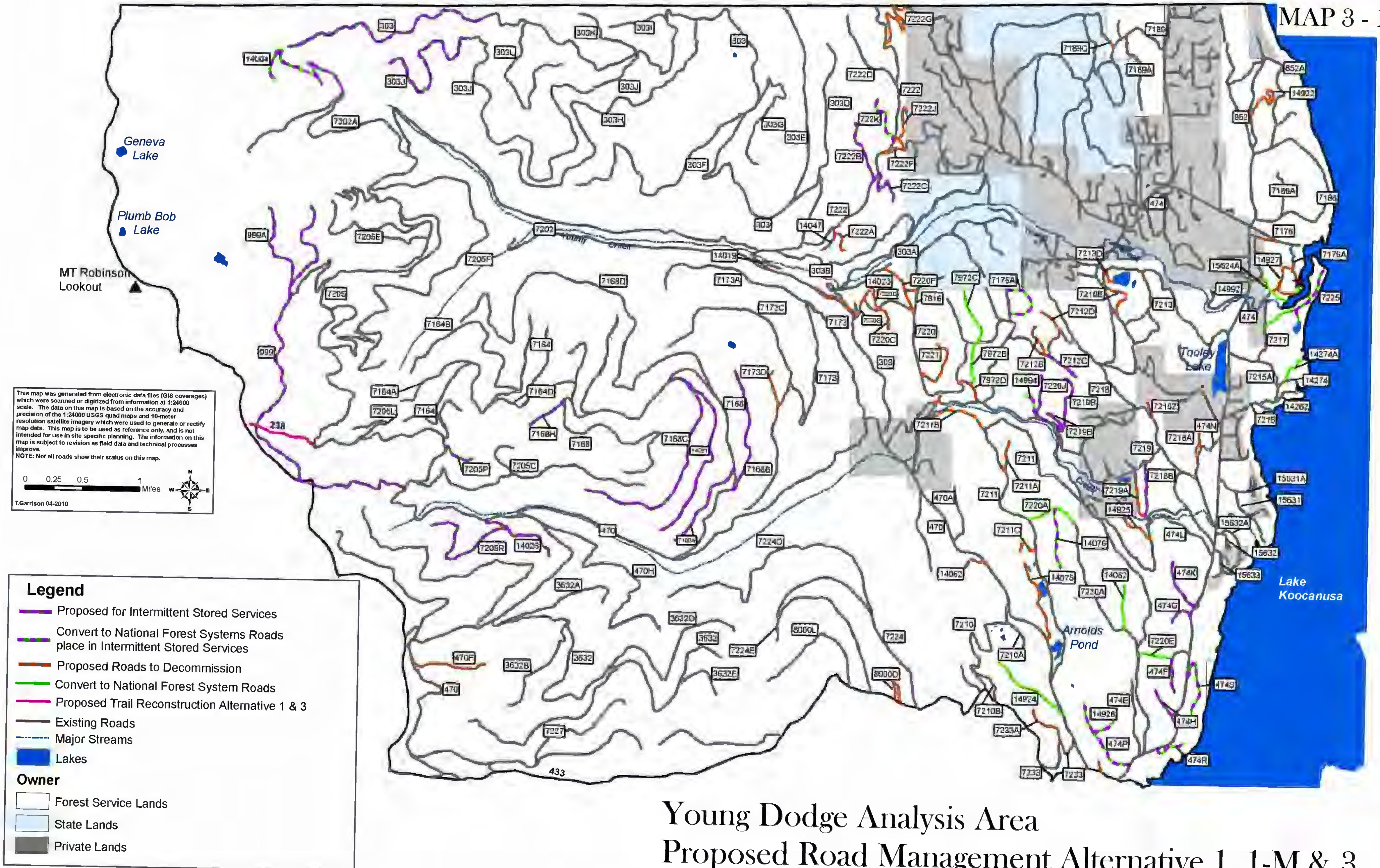


Young Dodge Analysis Area
Inventoried Roadless Area



Young Dodge Analysis Area Existing Road Management

MAP 3 - 15



Young Dodge Analysis Area
Proposed Road Management Alternative 1, 1-M & 3